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FINLAND, EUROZONE AND ASYMMETRIC SHOCKS

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ABSTRACT OF THE MASTER'S THESIS

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Abstract

This thesis has three following theoretical objectives. The first objective is to introduce the costs and benefits of a monetary union. The second objective is to introduce the concept of asymmetric shocks. The third objective is to introduce optimum currency areas (OCA) theory and its development from the 1960s. The theoretical framework is elaborated and supported by literature from notable economists and researchers.

This thesis has two following objectives on Finland and its EMU-membership. Firstly to introduce Finland's official economic report about the costs and benefits of the EMU *ex ante* and secondly to introduce 2010s Finnish economists' reviews on Finland's EMU-membership.

The empirical objectives of this thesis are to find out potential asymmetries in GDP trend deviations among the eleven original EMU-countries and Greece. For the second empirical objective, this thesis examines whether economic integration, in terms of GDP trend deviations, has increased in the above-mentioned countries during the common currency and lastly to find out how GDP trend deviations affect the unemployment rate in these countries, using a simple regression model.

According to the empirical results of this thesis, economic integration among the original EMU-countries has increased during the common currency. Hence, the member states have faced less asymmetric GDP shocks in the euro-period than before it. The finding supports the economic argument of the Eurozone. Germany is an interesting exception, as its GDP trend deviations are explicitly weakly correlated to the other member states. In addition, Germany and Greece together have the only negative GDP trend deviation correlation of all the EMU-countries. The results also depict that the economic integration of Finland has increased during the time of the common currency.

Economic stability, with respect to the size of GDP trend deviations, has not increased during the common currency. The results show that there are remarkable differences in how sensitively the labor markets in different countries react to the out of trend GDP shocks. Also, the member states have large differences in GDP growth rates, which can in the long run stress economic cohesion, thus widen the gap of living standards.

The empirical results discovered here can be widely used for further examination. Especially deeper country-specific investigation could provide reasoning for various smaller observations, for example, the close relation of Finland and Spain. Also, the results can be used as a comparison for similar research.

Keywords
Optimum currency areas, EMU, monetary union, common currency

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1 INTRODUCTION

On the 1st of January 1999 Finland and 10 other European Union (EU) member states established the Economic and Monetary Union (EMU, Eurozone) and adopted the euro as their common currency and sole legal tender. On the 1st of January 2002, physical euro notes and coins were introduced to ultimately replace national currencies. Subsequently, the Eurozone monetary union has expanded and currently 19 of the 27 European Union member states are part of it. The euro is the most traded currency by value after the US dollar and over 340 million people use it on a daily basis. The Eurozone member states have relinquished their national monetary policy to the European Central Bank (ECB). It can be seen as a political issue when a country gives up a part of its autonomy, but also as an economic issue because national monetary policy provides strong instruments for maintaining national price stability. The ECB aspires to practice monetary policy that is beneficial for the Eurozone as a whole. Therefore, it does not take a single member state's needs into account, which might be problematic if a single country's economy largely differs from other EMU members' economies. Eventually, economic divergence might lead to a situation in which the monetary policy of the ECB is ineffective or even adverse for deviant countries or regions. The study of this issue has a central role in this thesis and is a basis for the optimum currency area(s) theory (OCA).

1.1 Structure

The thesis is divided into three main parts. Firstly the theoretical framework of the subject including costs and benefits of a monetary union and the development of the OCA-theory is introduced. This section addresses the question of why a country or countries are willing to establish or join a monetary union, in this case especially the Eurozone. The costs and benefits of a monetary union are explained with brief and easily understandable paradigms based on economic textbooks of Paul De Grauwe (2018) and a duo of Richard Baldwin and Charles Wyplosz (2015). These authors' contribution to the study of international economics is remarkable. The OCA-theory part starts with Nobel laureate Robert Mundell's (1961) pioneering paper about optimum currency areas and later covers the development and criticism of the topic.

The second part focuses on an analysis of the EMU-membership of Finland but does not attempt to clearly state whether there are more benefits or costs from the common currency. The report of the Finnish EMU-Committee from 1997 has a major role in this section because it provides the most comprehensive groundwork for economic reasoning for Finland's membership. It covers the concrete costs and benefits the EMU could potentially bring to the Finnish economy. The section also includes 2010s reviews from acquainted Finnish economists Jukka Pekkarinen (2018), Pentti Pikkarainen (2014), Jaakko Kiander (2019), Ilkka Kiema (2017) and Vesa Vihriälä (2017).

The third and final part of the thesis is an empirical analysis composed by the author. The analysis is faithful to the concept of asymmetric shocks of the OCA-theory. In practice, euro-period GDP trend shocks of the first eleven EMU member states are compared among each other in order to find potential asymmetries, which in theory, weaken the function of common monetary policy. Lastly, it is analyzed how sensitive the country-specific unemployment rates are to the shocks. The ideal outcome of the analysis is to obtain support either for the monetary union membership or national currency. Since the analysis is not sufficiently encompassing, the author will not present unambiguous propositions for or against the monetary union.

1.2 Motivation

The topic has been a subject of interest probably as long as the study of international economics has existed however the particular optimum currency areas theory has attracted research from the 1960s on. The theory has been considered both in macroeconomics school books and papers of Nobel prize winners and by other influential researchers. In addition, there are enormous real-life examples in which the theories can be applied for instance The United States and especially the Eurozone. Indeed, the latter could be seen as an experimental manifestation of the optimum currency areas theory.

The topic is interesting as such as it deals with everyday small operations such as shopping online with a foreign currency but it also considers large macroeconomic affairs for example inflation, unemployment, and monetary and fiscal policies. Upon

joining a monetary union, every single individual of the country is somehow affected by the effects, which are dealt with in this thesis likewise in numerous other scientific papers and textbooks related to the issue.

Finland's current and past position, as well as the path to the EMU, are interesting, mostly because the author happens to be Finnish, but also for more thematical reasons. Firstly, Finland was among the early member states of the EMU, and no country had ever experienced such a significant change, in which several different nations adopt a common currency. Secondly, Finland is still the only country, that brings Nordic economic and cultural perspective to the monetary union, as the other Scandinavian countries never joined the EMU. Furthermore, Finland is geographically and perhaps economically distant from the core of the monetary union in which economic integration has occurred for long and the important common decisions are made. The Eurozone has faced two large economic crises during its relatively short existence. First the global financial crisis of 2008 and subsequently the alleged Euro crisis, which both have stressed the common currency. It is interesting to ponder if Finland's national currency could have been a better option during the hard times and in general.

1.3 Monetary integration

The core idea of the OCA-theory is not too complicated. Nowadays the costs and benefits of forming a monetary union are well known and there is a strong scientific consensus regarding the advantages and disadvantages upon a country joining the union. The question is how well the costs and benefits can be compared and whether the decision to join the union is worthwhile or not.

To understand what a monetary union is, knowledge about monetary integration is required. Tavlas (1993) proposes that monetary integration between countries has various degrees and they are defined in the following paragraphs. The definitions are based on the works of Corden (1972), Robson (1987 and later 1998) and Gandolfo (1992). The reason for the different degrees of monetary integration stems from the well-known trilemma and the preferred objectives of monetary authorities and governments (Cohen, 1992). The trilemma stands for the impossibility to maintain a fixed exchange rate, free capital flows and monetary autonomy simultaneously. The

theoretical argument for the trilemma is based on the Mundell-Fleming model (Fleming, 1962; Mundell, 1963).

1) *Exchange rate unions*. Exchange rates between the member states are fixed and fluctuations from the benchmark are not permitted. Monetary policies of the member states are not necessarily coordinated, but in order to comply with the trilemma, interregional capital flows must be restricted somehow.

2) *Pseudo exchange rate unions*. The term is brought forth by Corden (1972). It indicates fixed exchange rates and free capital mobility between the member states of the union, but without formal monetary policy integration. As a result, the fixed exchange rate peg is likely to loosen at some point due to speculative capital flows.

3) *Monetary integration*. This arrangement involves exchange rate unification, which means permanently fixed exchange rates and the absence of rate fluctuations. Monetary integration also includes free capital flows, the absence of currency conversion controls, financial integration and a common unionwide monetary policy. (Robson 1987, 1998, pp. 190–193.)

4) *Monetary unification*. This arrangement is *monetary integration* and in addition a single common currency and a unionwide central bank. The member states relinquish their national monetary policy to the central bank of the union. The central monetary authority controls foreign currency reserves (Robson, 1987, 1998, pp. 190). Moreover, monetary unification also entails responsibility for exchange rate policy with other currencies with the rest of the world.

In this thesis, *monetary unification* or in other words monetary union has the main focus of the mentioned degrees of monetary integration. Fixing exchange rates is assumed to indicate a monetary union with a single central bank and currency. The reason is that the other, lighter degrees of monetary union have a risk of currency peg break, that will likely shatter the monetary integration between countries. Secondly, the Eurozone is a full monetary union and represents a modern conception of monetary integration in the world of floating exchange rates.

2 THEORY OF MONETARY UNION COSTS

The fundamental cost of establishing or joining a monetary union is a loss of the national monetary policy. Frankel and Rose (1996) write that the advantages of a flexible exchange rate can be summarized into one major aspect, the independent monetary policy, which will be relinquished upon joining a monetary union. A national central bank, for example the Bank of Finland, may still exist yet it has no real power. It is rather a public authority under the indirect control of the ECB, and an economic research institute. As Mundell has stated, "A single currency implies a single central bank" (Mundell, 1961, pp. 658). In a monetary union, a national central bank cannot regulate the currency stock in the economy or change the short-term interest rate. Both of these actions affect a national price level, of which stabilization is usually considered the most important objective of the central bank, for instance, the ECB. Also, adjusting the national price level is a strong weapon against international demand shocks. The loss of national monetary policy can be considered as a political issue as well. People may think it is principally detrimental to give up national monetary autonomy, although the monetary union offers other benefits.

2.1 Shock dynamics

The concept of asymmetric shocks is introduced in Mundell's (1961) paper and later addressed in various textbooks, for example, De Grauwe (2018) or Baldwin and Wyplosz (2015). The loss of national monetary policy and the consequences of this can be comprehensibly demonstrated by simple examples of demand shifts on the market. Suppose that two countries for instance Finland and Sweden use a common currency, ergo have a monetary union. The countries experience an asymmetric shock whereat the aggregate demand shifts from Finland to Sweden. As a result, the output and price level declines in Finland and consequently increases in Sweden. On the other hand, unemployment rises in the former and decreases in the latter. Neither of the countries is in an optimal position. Finland faces a recession and Sweden an inflationary boom. This very situation is an asymmetric shock as it has different consequences in different regions. (Baldwin & Wyplosz, 2015, pp. 356–363; De Grauwe, 2018, pp. 4–14.)

There are two mechanisms that will automatically bring equilibrium back in the two countries. One is wage flexibility and the other is mobility of labor. Wage flexibility indicates that the unemployed workers in Finland are ready to request less wage, whereas the excess demand for labor will raise the wage level in Sweden. Due to changes in the labor costs, aggregate supply will increase in Finland and decline in Sweden. As a result, a new equilibrium occurs in which the price level of Finland is lower than initially, making the country internationally more competitive. The opposite takes place in Sweden. The risen difference in the wage level between the countries might alter the new equilibrium all the more. (Baldwin & Wyplosz, 2015, pp. 356–370; De Grauwe, 2018, pp. 4–8.)

If wage flexibility is insufficient, the mobility of labor will possibly lead to a new equilibrium[1][2][3]. As the name suggests, the mobility of labor means that the unemployed workers of Finland will move to Sweden as a result of excess demand for labor. The Finnish unemployment problem disappears, whereas the inflation problem fades in Sweden. The disequilibrium issue will not vanish if these mentioned mechanisms do not occur. Unemployment remains in Finland and inflation in Sweden. The real-world reasons that prevent the mechanisms from happening are for example language or culture barriers in the new country or bargaining power of labor unions. (Baldwin & Wyplosz, 2015, pp. 356–370; De Grauwe, 2018, pp. 4–8.)

Assuming the countries would have kept their national currency and were not in a monetary union, hence national monetary policy instruments to fight against unemployment and inflation could be utilized. The before mentioned being an adjustment of the domestic interest rate and de/revaluation of the currency. The former is effective in floating exchange rate regimes, for example, the dollar and pound sterling. Furthermore, the national central bank lowers the interest rate, which

[1] Blanchard and Katz (1992) show evidence that labor mobility plays a major role in the adjustment process to economic shocks between US states. However they acknowledge that labor mobility will likely remain lower in Europe.
[2] Eichengreen (1993) suggests with empirical data that domestic labor markets are considerably more responsive to regional disequilibria in the US than in the UK or Italy, supporting the proposition of Blanchard and Katz.
[3] Beyer and Smets (2015) propose that adjustment process to shocks is somewhat similar in Europe and the US but it takes longer and is not as responsive as in the former.

stimulates the domestic aggregate demand. This depreciation would reduce unemployment in Finland and lead back to the initial equilibrium. If Sweden were to raise its interest rate, aggregate demand would decline and dampen inflation. Again, appreciation of the domestic currency would take Sweden to the initial equilibrium.

The other method of de/revaluing works within currency peg regimes *id est* fixed exchange rate. Assuming that the mentioned countries have a currency peg, Finland suffers from unemployment and Sweden from inflation. In this case, Finland is willing to devalue its currency against the Swedish kronor, and therefore stimulate the aggregate demand from the latter to the former. The opposite takes place in Sweden. It wants to practice restrictive monetary policy, reducing the aggregate demand. Summarily, if wage flexibility is rigid and the level of labor mobility is low, countries in a monetary union have it harder to react to asymmetric shocks in comparison to countries that can utilize national monetary policy. As mentioned earlier, the adjustment of interest rate and de/revaluing are strong tools against shocks. Based on the given information here, Finland and Sweden should be skeptical about forming a monetary union from an economic point of view. (Baldwin & Wyplosz, 2015, pp. 356–360; De Grauwe, 2018, pp. 4–8.)

Baldwin and Wyplosz give a hypothetical example from the United States. Now the issue lies within the borders and not between two countries. Michigan was a home of the American car industry. Chrysler, Ford and General Motors attracted workers from all over the United States for secure and well-paid jobs. Afterward, the US motor industry took a hit and the demand declined. This hurt especially Michigan as Chrysler was sold to Fiat and both General Motors and the city of Detroit went bankrupt[4]. If the state would have had an own currency instead of the dollar, it could have depreciated the exchange rate, and therefore the cars made in Michigan would have been cheaper for the rest of the United States and abroad. American cars would have been more competitive against European or Japanese cars. The example is just demonstrative because no one really promoted abandoning the dollar in Michigan. The reason might

[4] See Klier (2009) for an overview of the Detroit automotive industry decline.

be that the dollar brings more benefits in general and it is assumed that one country means one currency. (Baldwin & Wyplosz, 2015, pp. 350.)

2.2 Debt dynamics

The loss of national monetary independence is not just a hit to the country's ability to deal with asymmetric shocks but also hinders the capacity to finance government budget deficits. Member states of a monetary union issue debt in a currency which they cannot individually control because monetary policy is relinquished to the central bank of the union. For example, Finland had full control over the national currency markka and also devalued it on demand prior to joining the EMU. The problem with nationally uncontrollable currency and debts is that financial markets obtain a theoretical possibility to force monetary union member states to default. This does not occur in countries that have kept the own national currency and are not part of a monetary union. Nevertheless, these countries might still undergo a default, but it is not easily forced by financial markets. The most straightforward way to explain the concept is to use the following examples.

Supposing Finland is not a member of a monetary union, it can practice national monetary policy and have control over own currency. The investors fear that the Finnish government is likely defaulting its debt. Consequently, they sell their Finnish government bonds, which shoots up the interest rate. In fear of the default, the investors want to get rid of the money they received from selling the bonds. The trade takes place through the foreign exchange rate market that will be flooded with the Finnish markka. The price of the currency drops until someone else is willing to buy it. Since Finland is a stand-alone nation and not part of a monetary union, its currency is worthless outside its borders. This means that the money remains in the country's asset market and does not escape abroad. In financial terms, the Finnish money stock is unchanged. If the investors are afraid to re-invest in government securities at a reasonable interest rate, the government can always force the national central bank to provide liquidity to finance the debt or pay out the bondholders. Hence, financial markets cannot drive Finland into default, because as a lender of the last resort the national central bank is capable of providing liquidity indefinitely. Printing money leads to inflation, but it does not change the fact that a country with own currency can

not be forced into default, and speculators are aware of this. (De Grauwe, 2018, pp. 8–12.)

Now in turn Sweden is a member of monetary union and has a common currency as a legal tender for instance the euro. Supposedly again the investors fear the country defaulting its debt, they sell their government bonds as a result. The interest rate rises, but now it does not affect foreign exchange rates as the investors are most likely not willing to trade the common currency for another. To evade transaction costs, the investors probably put their money in another country of the monetary union, so there is no need for currency exchange. Even if the money exchange was the case, it would hardly affect the exchange rate, provided that the rest of the monetary union is doing well. An assumption is that Sweden is relatively small compared to the entire monetary union for example the Eurozone. When the investors collect their money from Sweden and invest them in another country of the monetary union, the Swedish money stock shrinks as an outcome. As mentioned above, the exchange rate does not rise and puts a brake on the currency leak from the country. In addition, the national central bank cannot be forced to provide liquidity for financing the government debt or pay out the bondholders, because national monetary policy instruments are given up to the central bank of the monetary union. Theoretically, any monetary union member state can be forced into default, as the money stock is finite, but essentially the threat is toward highly indebted countries. On paper, a government liquidity issue can rather easily turn into a solvency crisis even without a speculative attack. Investors sell their bonds and the government has to increase the interest rate, which in turn leads to a higher debt burden. This would force the government to cut spending and raise taxes. Budgetary austerity is politically costly and at worst causes insolvency and a default. (De Grauwe, 2018, pp. 8–12.)

Asymmetric shocks combined with dubious debt mechanisms in a monetary union may lead to twofold harm. Suppose again that Finland and Sweden are in a monetary union together. The countries experience an asymmetric shock, reducing aggregate demand in Finland (recession), and increasing aggregate demand (boom) in Sweden. The weakened GDP in Finland results in higher unemployment transfer payments and lower progressive tax revenues *id est* the Finnish government budget deficit increases. If the deficit is sufficiently large, the threat introduced in the previous paragraph may

arise. Investors will become skeptical about Finland's solvency and sell the government bonds to save their money. The interest rate rises and the aggregate demand falls even further because the domestic consumption and investments decline. (De Grauwe, 2018, pp. 10–14.)

To state briefly, the debt crisis amplifies the initial negative demand shock in Finland and the opposite happens in Sweden. The investors probably re-invest the money they received from the Finnish government bonds to Sweden, where the interest rate consequently falls. This liquidity flow boosts the Swedish economy and the aggregate demand climbs even further than what it initially was. The positive demand shock in Sweden is amplified by the currency leak in Finland. In this case, the investors did not trust the Finnish government and it emerged as a destabilization in the monetary union. On the condition that investors do trust the government's financial standing, the effect dampens the liquidity flow from Finland to Sweden and it does not occur. The interest rate in Finland remains unchanged or at least moderate and the government easily acquires government bonds to alleviate the initial negative demand shock. Since the government of Sweden does not receive the investors' money from Finland, the interest rate also lasts unchanged and the amplifying effect does not take place in Sweden. All in all, the capital markets are in a role that decides between stabilization and destabilization in a monetary union. It is up to investors' view of how reliable they see governments in recession. The interest rate difference between the countries can be explained by the long-term government bond rates. Even if the central bank of the monetary union determines the short-term interest rate, the governments still have to pay a market-based interest rate for bonds. The price of funding is dependent on how risky the investors see the governments. (De Grauwe, 2018, pp. 10–14.)

3 THEORY OF MONETARY UNION BENEFITS

Being a member of a monetary union has relatively heavy costs, reducing monetary independence of a state. Expectedly monetary union has to offer benefits to make joining in rational. The academic consensus regarding the benefits of monetary union is rather coherent. According to De Grauwe (2018, pp. 55), monetary union costs are mainly macroeconomic while benefits are at a microeconomic level. The benefits are based on two essential features. The first is to get rid of transaction costs related to the exchange of national currencies. The second is the elimination of risk originated from uncertain exchange rate fluctuations.

Frankel and Rose (1996) are somewhat on the same line with De Grauwe. They say that two great advantages of fixing the exchange rate are; to reduce transaction costs and exchange risk, which can discourage trade and investment, and to provide a credible nominal anchor for monetary policy.

Correspondingly, Tomann (2017, pp. 23) lists currency union benefits as a) Transaction costs are reduced, b) Indirect effects: more transparent markets, c) Price discrimination is reduced, d) Monetary investment risks are diminished, e) Growth effects.

The European Commission (1990) evaluates in its One market, one money - report that the main benefits of the euro are 1) Exit exchange rate transaction costs, 2) Exit exchange rate uncertainty costs, 3) Indirect dynamic gains from economic and monetary union, 4) Business expectations and growth.

Corden (1972) mentions the reduction of destabilizing speculations and an increase in capital mobility being the two possibly favorable effects of an exchange rate union. One can conclude that the understanding of the theoretical benefits of a monetary union is fairly consistent. After all, the lists of benefits from the economists and institutions essentially aim at the same objective, general balance in the economy in terms of unemployment and price stability.

3.1 Transaction costs

De Grauwe, Baldwin and Wyplosz approach the absence of transaction costs pragmatically. The former proposes that about 5% of bank revenues are commissions paid to banks in the exchange of national currencies. In a monetary union, this revenue naturally disappears. De Grauwe says that transaction costs related to exchanging money are a deadweight loss for consumers who have to pay but get nothing in return. He continues that in monetary union banks have to replace the revenue loss of transaction costs, meaning they must focus on other profitable activities, which will be utility for society. Baldwin and Wyplosz point out that without a common currency, exporters and importers have to negotiate which currency would be used. Both parties prefer their own currencies, but in the end someone has to bear the transaction costs. First they might seem trivial, but after all they are deadweight loss, which takes resources from the core activity. (De Grauwe, 2018, pp. 55–56; Baldwin & Wyplosz, 2015, pp. 352.)

3.2 Price transparency

Upon a common currency, prices of goods become directly comparable between the countries in a monetary union. This will increase competition especially with lower transaction costs. For consumers it is easier to buy goods outside of their own country. The increased competition is expected to be a benefit for the consumers as prices decline and producers are more encouraged to innovate their products. Price transparency also restrains inflationary wage-setting process because devaluations or exchange rate depreciations are no longer available with the common currency. If the exchange rate is adjustable, wages and prices tend to rise particularly in export sectors thus reflecting to the entire economy. Eventually, this inflationary process will harm the country's competitiveness and the exchange rate is used to reset the economically and socially adverse vicious circle. The depreciation helps export sectors and increases competitiveness, but at the same time prices of imports rise as well, meaning that the method is not so efficient altogether. Under a fixed exchange rate regime, wage-setting must be moderate and controlled as the absence of depreciation leads to wage cuts, layoffs and longer working hours in order to keep or increase a country's competitiveness. (Baldwin & Wyplosz, 2015, pp. 353.)

De Grauwe agrees with Baldwin and Wyplosz on the theory yet states that there is a lot of evidence that price discrimination is still widely practiced in Europe. He refers to Eurostat statistics and proposes that in 2011 in Finland an average basket of goods was 22% more expensive than in the Eurozone, while the cheapest basket was found in Slovakia having it 30% cheaper than the Eurozone average. This means over 50% price difference between the cheapest and the most expensive ones. It is worth noting that the compared items were supermarket products, which allows price differentiation, as people tend not to buy groceries from abroad. De Grauwe writes that the price differentials still remain high for more expensive products such as cameras, cellphones, and cars. The euro might have improved price comparison, but it is doubtful that it has done much to eliminate the price differentials, he adds. (De Grauwe, 2018, pp. 56–59.)

3.3 Uncertainty

Exchange rate fluctuations are very difficult or impossible to predict, meaning they contain a risk related to future uncertainty. If exports are priced in the currency of the exporter, the importer bears an exchange rate risk, as it does not precisely know what the exchange rate will be in the future when it is time to settle the purchase. Countries in a monetary union do not have to experience this risk in trade between the other member states, because they use a common currency. Eliminating the exchange rate uncertainty leads to a less risky business environment and companies can focus more on their core activities. This applies to foreign direct investments as well. Apart from macroeconomic use, exchange rate changes are mainly just an unnecessary nuisance. (Baldwin & Wyplosz, 2015, pp. 353; De Grauwe, 2018, pp. 59–61.)

It is worth mentioning that a company may achieve higher average profits under the floating exchange rates even if the rate changes are equally balanced and do not favor the company. Assuming that the firm's marginal cost curve is conventionally U-shaped and under the fixed exchange regime, prices are fixed as well. As a result, the firm can completely predict the future profits, provided that the price equals marginal cost. The floating exchange rate regime is a different case. Supposedly the actual prices symmetrically float around the fixed price, inducing that the flexible exchange rates lead to volatile profits. The nature of upward opening MC-curve indicates, that on

average, profits are higher under the floating exchange regime than the fixed one. Humans tend to be risk-averse and prefer certain lower income over uncertain higher income, so after all, one could argue that the elimination of the floating exchange rates is beneficial at the microeconomic level. On the other hand, the assumption about symmetric exchange rate fluctuation is naive, because they are not normally distributed. Movements of the exchange rates do not follow any particular pattern and it engenders a possibility for tail risks with low probability but large change. The mentioned example suggests that the profits or any outcomes are not equally weighed. It could happen that the actual price falls under the MC-curve. This eventually drives the company out of business. (De Grauwe, 2018, pp. 59–61.)

Corden offers a similar view from the traditional era. He writes that the permanent and complete fixing of exchange rates within the union will end destabilizing speculative capital movements in the short-term. A floating exchange rate is not a problem as such, but if it is not frequently adjusted it may lead to a currency risk. The two main adverse effects of exchange rate fluctuations are instability in the general price level and the utility of money as a store of value is declined, Corden says. A fixed exchange rate regime eliminates the mentioned issues as stated above. Corden emphasizes that the possible gains of the fixed exchange rate affect through capital movements, that is to say the exchange rate fluctuations are insignificant in the absence of capital flows. (Corden, 1972.)

The absence of exchange rate risk will stimulate economic growth, via a mechanism of decline in the systemic risk[5]. Since exchange rates and the risks related to them do not exist within monetary union, investors will require a lower interest rate. In theory, a monetary union is a less risky environment and the prevailing interest rate declines in the same proportion as the risk vanishing along with the exchange rates. The mechanism is explained by using the Solow-Swan neoclassical growth model, in which the ultimate cause of the long-run economic growth is technological progress. The concave production function is tangent to a line of which slope indicates an interest rate. The elimination of exchange rates reduces the interest rate and the line

[5] See Baldwin (1989). The paper offers a comprehensive theoretical analysis of potential growth effects regarding the European market liberalization from 1992 onwards.

becomes flatter. The new tangent point lies higher on the function curve, which indicates that the economy has more output and capital per worker. Consequently, the economic growth has increased temporarily but returns to its initial level, which depends on technological progress and population growth rate. (De Grauwe, 2018, pp. 63–64.)

3.4 Currency substitution

Currency substitution or informally dollarization is separated from the other monetary union benefits because it is essentially advantageous for particular countries only. If a country's monetary authorities are weak and cannot achieve or sustain a desirable inflation level, the country may see a monetary union as an option, given that the central bank of the union practices strict low-inflation monetary policy. By definition, dollarization refers to countries in economic crises that adopt the US dollar as their legal tender for example certain Latin American countries. In the case of the euro, Kosovo and Montenegro have adopted it as their sole currency, but they have no issuing rights, as they are not part of the Eurozone.

In the context of monetary union benefits, currency substitution is rather considered as joining the monetary union instead of just adopting the currency. The elimination of national currency may truly fix the country's inflation problem, but the requirement is that the central bank monetary policy is strict, thus the low inflation is valued more than unemployment. The Barro-Gordon model (1983) demonstrates that the equilibrium unemployment level can be reached with higher or lower inflation depending on the credibility of monetary authorities. Also, there is a risk that the country's weak monetary authorities will have power in the central bank of the union turning it weak and the initial benefit is gone.

Corden (1972) points out a related issue that the countries have different positions on the Phillips-curve[6]. It can be based on the structural factors such as labor productivity or it is up to different preferences of the governments or central banks. In any case, the differences in inflation-unemployment ratio between the countries lead to a problem in a fixed exchange regime, as only one kind of policy can be practiced at a time. If the countries are in this respect alike, the issue disappears as it does with asymmetric shocks and the cost of a monetary union is reduced. If the optimal monetary union policy involves different rates of inflation while the exchange rate is fixed, some countries are forced to depart from the initial points on the Phillips-curve. This leads to a situation in which concerned countries end up having an unfavorable trade-off thus suffer either inflation or unemployment more than they would like to. There is no need to go further with this topic in Corden's analysis, because about a decade after him, Barro and Gordon (1983) introduced the above-mentioned model, which states that the certain unemployment (NAIRU[7]) can be achieved with both low and high inflation. Hence, the trade-off between unemployment and inflation is not set in stone as much as Corden and other contemporary economists implied. The desirable low inflation - low unemployment ratio requires dedication from the government and monetary authorities. It is crucial that the central bank of a monetary union has credibility and is capable of practicing appropriate low-inflation monetary policy, or otherwise the union will not succeed.

According to Corden and De Grauwe, only a full monetary union establishes the required credibility for the country that suffers from high inflation. By this, they refer to currency peg always offering an incentive to devaluation and temporarily reducing unemployment at the expense of inflation, which eventually leads to the situation prior to the peg. Generally, the rest of the monetary union does not have to bear any welfare loss from a single state's inflation rescue, provided that the union can still maintain the strict monetary policy. On the other hand, a country with high-inflation may reach low inflation upon joining a monetary union, but it does not automatically abolish other

[6] The Phillips-curve is a theoretical model describing an inverse relationship between unemployment and inflation. Short-run empirical research supported the theory until the 1970s stagflation. Modern versions of the model are still used for understanding the relationship.
[7] NAIRU stands for the non-accelerating inflation rate of unemployment. Theoretically, unemployment rate below the NAIRU level will increase inflation.

economic issues such as weak budgetary discipline. This makes the former high-inflation country more vulnerable to speculative attacks and a sovereign debt crisis in the monetary union. (Corden, 1972; De Grauwe, 2018, pp. 41–49.)

4 THEORY OF OPTIMUM CURRENCY AREAS

4.1 Traditional approach

The theory of optimum currency areas (OCA-theory) attempts to answer the question of which or what kind of countries or regions should adopt a common currency and form a monetary union. As the costs and benefits of a common currency are generally acknowledged, the puzzle is to examine how well countries or regions can deal with the negative effects and are the benefits worth it. If economies were identical, the task would be easy on paper, but in reality, countries and even regions within might vary a lot making the deliberation difficult.

In the 1960s capital controls and fixed exchange regimes, for instance, Bretton Woods[8] were common. Canada was one of the few examples to utilize a flexible exchange rate regime. This was seen as risky due to exchange rate fluctuations (Mundell, 1961). Probably the European integration after World War II motivated economists to take a more elaborate look into international economics and monetary integration. The idea of the OCA-theory was first introduced by Robert Mundell in 1961 and a bit later developed further by McKinnon (1963) and Kenen (1969). Without exception, these three economists are mentioned in the literature about the development of the OCA-theory. In 1999 Mundell received a Nobel prize for his work in monetary dynamics and optimum currency areas. The recognition was obviously associated with the birth of the EMU. Prior to Mundell, economists such as Lerner (1944, 1947), Friedman (1953), Meade (1957), Scitovsky (1958, pp. 79–99) and Ingram (1959) have put forth some thoughts about exchange rate regimes. Lerner (1944, pp. 370–377) recognized the macroeconomic properties of the gold standard that are still valid in monetary economics. Later he pointed out the value of labor mobility as a smoothening factor between unemployment and wage pressure (Lerner, 1947). Also, Meade and Scitovsky have emphasized the importance of labor mobility which is a determinant in choosing an exchange rate regime. According to Scitovsky, a fixed exchange rate regime

[8] Bretton Woods was a monetary system in which various western currencies were fixed to the US dollar, that was for its part fixed to the gold standard. The system existed between 1944–1971.

encourages capital mobility among countries whereas Friedman's contribution was an in-depth analysis of flexible exchange rates. Ingram weighed monetary integration as crucial for achieving a functioning monetary union.

4.1.1 Mundell

In summary Mundell's theory implies that common currency is optimal in areas that have a sufficiently high level of factor mobility. In his terms factor mobility is both labor and capital mobility. He states followingly, "If the world can be divided into regions within each of which there is factor mobility and between which there is factor immobility. Then each of these regions should have a separate currency which fluctuates relative to all other currencies" (Mundell, 1961, pp. 663). A slightly more explicit definition could be that the regions without unemployment or inflation issues have an optimal exchange rate regime, whether it is fixed or floating. However, Mundell's theory does not take national borders into account in forming single currency areas, although he recognizes them as a potentially restrictive feature. (Mundell, 1961.)

He argues that the flexible currency regime is ineffective if industrial regions do not correspond with national boundaries. On the other hand, he adds that the most favorable case of flexible exchange rates is an asymmetric shock between two countries, which they defeat with national monetary policy instruments. Both of these arguments are still considered to be economically valid and a basis for the modern approach of optimum currency areas. Also, Mundell's statement about the factor mobility being a crucial feature in the automatic adjustment process is generally acknowledged as it is mentioned in chapter two. Nevertheless, Mundell cannot answer what is the sufficient level of factor mobility for an optimum currency area, but the optimal region is neither the whole world nor an individual consumer. (Mundell, 1961.)

4.1.2 McKinnon

McKinnon expands Mundell's idea of optimum currency areas by taking into account a country's openness. His main proposition is that open, hence usually small countries are favorable to form an optimum currency area. In this case, openness particularly indicates the ratio between tradable and non-tradable production. Also, typically economic openness and the small size of a country go hand in hand because the presumption is that a small country does not have the resources to be self-sufficient. McKinnon's view of optimum is that a single currency area can achieve the best combination of the following three objectives: full employment, the balance of international payments, and a stable internal average price level. (McKinnon, 1963.)

McKinnon's assumption is that small countries' domestic exchange rates or currency prices do not influence the international price level of tradable production, hence the prices of tradable goods are given. Under the floating exchange rate regime, an open and small economy is therefore more vulnerable to price fluctuations or in McKinnon's terms, 'unwanted speculative movements in a floating exchange rate'. This harms the third objective of maintaining internal price stability. An optimal decision would be a policy of completely fixed exchange rates. De Grauwe (2018, pp. 51–52) clarifies McKinnon's view by explaining that exchange rate fluctuations can stimulate the exports of a country thus the openness is advantageous. Nevertheless floating exchange rates can hit the other way around and adversely raise the costs of imports. The shifts are more intensive in a relatively open economy than a closed one, he adds. Even if the supply and demand effects were balanced in the long run, the aggregate price level would undergo harmful fluctuations resulting in inflationary booms and unemployment from recessions. National monetary policy tools are used to control the exchange rate shifts and they can dampen the shocks. However, the systematic use of the monetary policy instruments probably leads to additional fluctuations in the exchange rates and then the aggregate price level is constantly in motion. As said, in a relatively open economy the shifts are stronger and require intervention from monetary authorities. This is costly and makes a monetary union seem more attractive choice compared to the floating exchange rate regime.

4.1.3 Kenen

The third early OCA influencer, Kenen (1969) thinks that the countries with well-diversified economy are the most appropriate or – the least inappropriate candidates to form an optimum currency area. The diversified economy refers to a wide range of production and exports and thus consumption and imports. The main idea is that diversification minimizes the damage from inevitable asymmetric shocks in a monetary union and the explanation is based on the law of large numbers. It is highly unlikely that economic shocks affect a country's production and exports holistically if they are widely diverse. An opposite amplified effect takes place in a poorly diversified single-product country. If the before mentioned country was a member state of a monetary union, it could not use national monetary policy instruments to raise the sunken demand. The point is that asymmetric shocks hit the single-product countries harder and therefore economically diversified countries are more suitable to form an optimum currency area. Although, Kenen admits that his argument is not valid if the diversified economy faces, in his terms, business-cycle swings that affect the entire spectrum of production and exports. He writes that developed countries should perhaps join the Bretton Woods regime and less developed, thus less diversified countries, are likely better to resort to a completely flexible regime. An interesting unrelated remark is that the Bretton Woods system collapsed just two years later after publishing his paper.

Kenen's (1969) incentive to participate in the discussion was that he thought Mundell having too simplistic assumptions of factor mobility or particularly labor mobility being a cure for asymmetric shocks between two regions. Mundell's optimum currency areas are not found on an ordinary map but rather formulated with the use of an input-output table, he writes. The argument was that in a real-world situation the labor force is not as mobile as Mundell's theory requires. On the other hand, Kenen believes that Mundell's internal factor mobility intensifies after diversified countries have formed a fixed exchange rate regime. Also, McKinnon's view on the OCA-theory was in contradiction to Kenen's. The former rests on the economic openness which is typical for small countries as opposed to the economic diversification which for one part is more likely for larger countries. Briefly, small economies tend to specialize in specific industries due to lack of resources and large economies tend to diverse because

resources allow it. So generally, McKinnon's optimal single currency countries would not accomplish Kenen's criterion and *vice versa*. However, Kenen did not discuss McKinnon's point of view apart from introducing his definition of optimality concerning the OCA-theory.

It is noteworthy to mention, that Kenen is among the first, who takes the importance of common fiscal policy into account regarding the optimum currency areas. According to him, fiscal and monetary policies constitute a policy mix that should be in use within the same domain, for example, a currency area. Fixed exchange rate regime cannot altogether eliminate imperfect labor mobility or export fluctuations but then budgetary policies, for example transfer payments, come into play. DeGrauwe (2018, pp. 17–19) argues that adopting a budgetary union with fiscal transfers is the only way to form a complete functional monetary union and it is a necessary step for the Eurozone as well.

4.1.4 Criticism

In the 1970s the collapse of the Bretton Woods system and the so-called Werner report of European economic and monetary union (Commission of the European Communities, 1970) likely induced economists to take the discussion of the OCA-theory and monetary integration forward. Corden (1972) proposes an exact opposite argument contrary to McKinnon's openness- optimal view. According to Corden, the more open the economy, the greater are the gains from exchange rate variability provided that economic shocks are external or in his terms, of macro nature. If domestic factor costs are stable, but foreign prices and costs are fluctuating, then the country is experiencing external instability through exchange rates. Monetary authority's proper exchange rate adjustments can protect the domestic economy from foreign shocks. Theoretically, the perfect result is to exactly offset foreign price changes so the domestic price level remains unchanged and foreign trade risk is reduced. Hence the domestic currency has kept its liquidity and the exchange rate risk does not occur as the real price level is unaltered. In Corden's words, exchange rate variations fulfill an insulation role. (Corden, 1972.)

In case the exchange rate variations are micro by nature, that is to say, caused by demand or supply shifts domestically while the foreign price level is stable, then McKinnon is right. If economic disturbances are endogenous, then a fixed exchange rate regime is favorable due to the price stability it brings. Corden gives an example of Germany before it joined the Euro. Germany is able to maintain price stability within its borders but faces rising prices abroad. If it does not adjust the exchange rate but keeps it constant in a fixed manner, the domestic price stability will take hit through the foreign trade. The domestic costs could stay the same but as the import prices rise, it will affect the entire domestic price level, thus Germany has to comply with the foreign disequilibria. Hence, inflation is imported. In this case, the more open the country, the more it will suffer from the inflation brought abroad and McKinnon's argument becomes invalid. Germany could implement an exchange rate appreciation that will even out the inflationary foreign price shifts. This, of course, is not possible in a monetary union, because the exchange rate is fixed and that is the reason why Corden argues against McKinnon's view in the first place. It is worth emphasizing that the appropriate viewpoint depends on the cause of price level disturbances. (Corden, 1972.)

Corden's skepticism goes a little deeper. Even if an open country could reach price stability through a fixed exchange regime, as McKinnon assumes, Corden doubts that the country would obtain any gains from the monetary union. The more open the country is in terms of tradable and non-tradable production, the less costly is the fixed exchange rate compared with a relatively closed country. The actual gains are somewhere else, he says. The benefits of a monetary union are already brought up, but admittedly they probably were not present in the 1970s to the same degree as nowadays or at the time when the EMU was established. On the other hand, Corden believes that a monetary union is a rational choice if an individual country cannot for a reason or another maintain its currency. There will be difficulties and a risk that the factual money in use is not the own currency but some key currency for example dollar from abroad. A monetary union is a way to escape the currency crisis by means of borrowing credibility from the union. Nevertheless, he thought that apart from the micro-nations, all the member states of the European Economic Community were feasible currency areas on their own and probably better off without a monetary union. (Corden, 1972.)

Ishiyama (1975) represents a critique of the 1960s OCA approach from Mundell, McKinnon, and Kenen. In the traditional approach, the currency area optimality rests on a single criterion of some economic attributes. For Mundell it is factor mobility, McKinnon suggests openness and Kenen- the diversity of production. The optimality itself is measured by standard objectives of economy such as low unemployment, price stability, and a balance of payments equilibrium. Mundell distributes regions regarding factor mobility and immobility until the desirable economic stability is achieved. He writes that the greater the number of separate currency areas in the world, the more successfully the stability is reached, which supposedly implies tiny single currency regions. The small regions are particularly vulnerable for speculative attacks and the minor currency loses its credibility as a medium of exchange. Hence, the stability from factor mobility is canceled by the instability caused by a minor currency.

According to Ishiyama (1975), Mundell does not separate labor and capital mobility from each other, which is a rather too simple assumption. Generally, labor mobility and capital mobility do not have the same conditions, even though they can be somewhat correlated. The former bears social restrictions such as cultural differences, the latter does not, but it has something else affected by. Hence, the shifts of these two are not uniform.

Supposing that aggregate demand shifts from country B to country A under a fixed exchange rate regime. Unemployment rises and price level declines in country B. An opposite takes place in A. The deflationary environment in country B leads to a situation in which saving is preferable contrary to investing and the unemployment grows even further. In this case, the capital is immobile but deep recession might motivate labor to move from country B to A. In other words, labor and capital mobilities have distinct directions demonstrating Mundell's assumption ambiguous. The more crucial and more injurious expectation is that interregional labor mobility is factually enough to enable Mundell's theory. Here the following social restrictions come into play; language barrier, different habits, cultural differences, and the effort of moving to an unfamiliar environment. Scitovsky writes that "There is plenty of evidence that labor moves reluctantly and only as a last resort even within the same country" (Scitovsky, 1967, pp. 523). Corden (1972) also believes that labor immobility is certainly more realistic than high labor mobility. Moreover, he points out that

particularly high labor mobility is harmful and inflicts social and economic costs, provided that all the unemployed workers move somewhere else and serve as effective Mundellian factor mobility. This leads to real-wage differences in the monetary union, even though the labor is mobile. After all, Corden thinks that labor mobility is an insufficient substitute for flexible exchange rates.

Later Mundell (1973) came up with an idea that financial integration in a single currency area provides insurance and thus dampens asymmetric shocks. In his example, two islands with own currencies practice trade with two island-specific crops, which have completely contrary growing seasons. Economies are fine as long as the trade is in balance and the number of crops is equal. If the crop production in either island differs from the long term, this means it is hit by an asymmetric shock, then the currency takes a hit as well and the island dwells into an economic problem. In Mundell's case, it would have been about life and death, as the islanders would have starved without the crops from the other island. A common currency could have increased credibility among the islands due to the absence of exchange, and the money borrowing would have been easier. In terms of risk-sharing, a common currency reserve pool could have helped with the seasonal asymmetric shocks as well. It is worth noting that the shocks must be temporary because the islands will not loan money to one another indefinitely. Something else must be done if the crops do not grow. Again, Ishiyama (1975) finds Mundell's argument vague and intuitive and does not identify the benefit of risk pooling. On the other hand, De Grauwe (2018, pp. 49–50) finds that now Mundell advocates the single currency regime, because of the above-mentioned financial integration and that asymmetric shocks are caused by exchange rate fluctuations and not *vice versa*. In other words, exchange rates are not the tool against asymmetric shocks, but they might be the reason or at least an amplification for the shocks. De Grauwe writes that there is a lot of evidence that exchange rate movements are often disconnected from underlying economic fundamentals and therefore psychological factors have a greater role instead.

In the case of McKinnon, one can conclude that Ishiyama agrees for the most part with the proposed arguments but the theory fails on the same strict assumptions that Corden (1972) finds problematic. Firstly, the principal cause of the balance of payment disturbances is originated in microeconomic changes in country's aggregate supply

and demand. Secondly, the rest of the world maintains price stability. If the surrounding world is required to be more stable than a small open country, then the preconditions for the prevailing theory are too harsh. Ishiyama emphasizes that the world economy in the 1970s is less and less stable than it was in the 1950s or 60s, thus the real world does not support the viewpoint of external price stability. (Ishiyama, 1975.)

The argument that McKinnon did not himself clearly introduce, but is derived from his theory, is the absence of money illusion and the diminishing power of using a flexible exchange rate. If the portion of imports is considerably large of consumption in a small and open country, then the real income effect of flexible exchange rate fluctuations is so noticeable that the domestic firms and consumers do not accept it without a reaction. For example, monetary authorities of a small and open country would try to stimulate the aggregate demand with a depreciation of the currency. As the imports are in a major role of the production, they directly reflect to the prices of end-products, and the desired stimulating effect of flexible exchange rate instrument disappears. The same applies to wages and consumption within the country. This absence of money illusion makes the flexible exchange rate an inefficient tool to correct external disturbances. Also, in small and open countries, there is usually a lack of domestic substitutes for imported products or even services. Thus, the price elasticity of imports with respect to an exchange rate is relatively low and the required exchange rate change for adjusting the balance of payments is high. Therefore, the fixed exchange rate becomes a more attractive choice for small and open economies. (Ishiyama, 1975.)

Regarding Kenen, Ishiyama states that his proposition of economic diversity and a correct exchange rate regime seems to be so simple, that his formal model is pointless. The mathematical model implicitly assumes that labor supply is infinitely elastic with respect to a nominal wage rate. The assumption is rather unrealistic, but still necessary for the formal model, which implies that only the essential thesis of Kenen should be considered. Basically, the only proposition Kenen delivers is the law of large numbers within international trade. (Ishiyama, 1975.)

Frankel and Rose (1996) also find Kenen's diversification argument logically questionable. The drawback lies within the criterion of how an optimum currency area is defined. Supposing that two diversified regions form a monetary union, the combined area becomes more diversified than the individual regions were initially. A third sufficiently diversified region is willing to join the union and thereby the combined diversity grows even more with a wider margin. The mechanism allows that the new joining regions do not necessarily have to be so diversified, assuming the union's combined diversity will increase. As the process continues, eventually the entire world will be an optimum currency area, which was not Kenen's intention. The illustration works the other way around as well. If the individual region is not sufficiently diversified in the first place, it should be divided into smaller units that have their own floating currencies. Again, the process will continue until the world consists only of completely specialized individuals. This indicates that Kenen's view does not have an equilibrium in which the regions are satisfied, because continuous expansion increases economic diversity. To some degree, similar nitpicking could be applied to McKinnon's and Mundell's viewpoints from which Mundell noticed the issue first. The main purpose is likely to emphasize the characteristic nature of the OCA-theory rather than falsify Kenen. It is difficult to determine what is the sufficient or alternatively insufficient level of diversity, openness or factor mobility to fulfill the criteria of optimum currency areas. Nevertheless, Frankel and Rose suggest that economic specialization is rather a more appropriate feature for the OCA-theory instead of diversity. This is because, in a real-world situation, regions tend to approach the midway and not the above-mentioned extremes. On the other hand, Frankel and Rose admit that governments might not strictly follow the optimum currency area criteria in choosing the exchange rate regime, implying that the OCA-theory is not a bunch of rules, but guidelines that could lead regions or in fact countries to economically preferable positions.

Apart from the author-specific criticism, Ishiyama points out that the early contributions of the optimum currency area theory lack a concept of comparing the benefits of a fixed exchange regime to the costs it brings. Certainly, the economists recognized and understood the reciprocal property of adopting a fixed exchange rate, as there is no such thing as a free lunch, but the idea of cost-benefit analysis was not clearly put forth by the early contributors. They rather pondered what sort of regions

should adopt a fixed exchange rate. The pros and cons of a monetary union are not static and therefore not easily comparable. Presumably, a simple quantitative measure of positive gains or losses such as an increase in GDP, is impossible to discern. The costs and benefits take place in several different domains in the economy however, they are distinct yet not commensurate. (Ishiyama, 1975.)

The traditional approach of the 1960s OCA theorists gives important insights but does not sufficiently cover various issues with comparisons nor definitions and generally remains quite ambiguous. Therefore, Ishiyama suggests an alternative approach, which takes the costs and benefits of a common currency explicitly into account. (Ishiyama, 1975.) Indeed this is the basis for the modern approach of optimum currency area theory. Difficulties in finding a theoretical consensus and building a precise cost-benefit analysis indicate that the OCA-theory is primarily an academic discussion, which does not provide many solutions to practical problems of exchange rate policy. Willett and Tower (1970, 1976) somewhat agree with Ishiyama, that the unified theory of optimum currency areas does not exist. Thus, there is no general agreement on the relative importance of the proposed factors, concerning an optimal exchange rate regime, and it will probably remain like that. Attaining a strict unified theory is a fallacy. On the other hand, the concept of optimum currency areas offers useful information and increases the discussion around fixed versus flexible exchange rates. Consequently, economies are more aware and might deliberate alternative exchange rate regimes, even if they are not willing for a reform. Lastly, Willett and Tower state that the decision of forming a currency area is of course ultimately a political one. Similarities in cultural heritage, language, politics, and ideology are factors that affect the incentive to operate in a group, but economic benefits can outweigh them. Members are ready to make compromises and give up some social similarity if the result is a successful currency area.

4.1.5 Summary of different perspectives

Tavlas (1993) summarizes the characteristics or rather preconditions of the potential members for an optimum currency area. The criteria are based on the early literature of the subject and later dealt with in economics textbooks. (See Baldwin & Wyplosz, 2015; De Grauwe, 2018; Gandolfo, 1987; Salvatore, 1993). The following characteristics have been proposed as relevant for the potential countries to form an optimum currency area:

1) *The similarity of inflation rates*. Similar inflation rates tend to balance the flows of interregional current account transactions within the currency area compared to divergent inflation rates. (Fleming, 1971.)

2) *The degree of factor mobility*. Factor mobility provides a substitute for exchange rate flexibility as a tool for dealing with external disturbances. Therefore, the countries with a high degree of factor mobility are preferable for forming an optimum currency area. (Mundell, 1961.)

3) *The openness and size of the economy*. Open and small economies are potential members for an optimum currency area because a fixed exchange rate protects the economies from significant effects of price fluctuations. Also, the fixed exchange rate provides liquidity, as the price level fluctuates less in closed economies than relatively open ones. (McKinnon, 1963.)

4) *The degree of commodity diversification*. If a country's production and thus the exports and imports are highly diversified, the country is a potential member for a currency area. The math behind the diversification lowers the risk of being hit by significant shocks and eliminates the need for frequent exchange rate adjustments. (Kenen, 1969.)

5) *Price and wage flexibility*. If prices and wages are flexible within regions, then the need for exchange rate adjustment is nonexistent. Unemployment and inflation that are originated from asymmetric shocks, will be automatically stabilized through the price

and wage flexibility making the exchange rate policy unnecessary. (Friedman, 1953; Kawai, 1987.)

6) *The degree of goods market integration*. Countries with similar production structures nullify the effectiveness of exchange rate adjustment between the countries in case they face symmetric terms-of-trade shocks. Therefore, the countries are better off forming a currency area. (Mundell, 1961.)

7) *Fiscal Integration*. A high level of fiscal integration between countries increases the ability to deal with asymmetric shocks, through fiscal transfers. Transactions take place from low-unemployment countries to high-unemployment countries balancing the divergence. Usually, some form of political union is associated with the interregional high-level fiscal integration. (Kenen, 1969.)

8) *The need for real exchange rate variability*. Criteria from one to seven are difficult to measure accurately and lack an actual way to measure them, so comparing might be impossible. In turn, real exchange rate changes are easily measurable from historical data, and thus conclude whether the exchange rate instrument is necessary for a country or not. (Vaubel, 1976, 1978.)

9) *Political factors*. The major and perhaps the only real condition for establishing a monetary union is the political will to integrate with the other compatible and likeminded countries (Mintz, 1970, pp. 33). The view has support from Cohen's (1993) empirical study. Political factors are found to be superior to the economic criteria in successful currency areas.

4.2 Modern views

The theory of optimum currency area received only a little attention from the mid-1970s until the mid-1980s. Probably the reason for it was that the OCA-theory or the researchers among it could not bring forth anything new or interesting. The OCA-theory could not answer whether a region is a currency area or not. Also, the lack of practical use encouraged economists to study something more topical. In Tavlas (1993), The 'New' Theory of Optimum Currency Areas - paper he writes that "the

subject was for years consigned to intellectual limbo", which imbued the discussion around the subject. Though a lot of studies were done in recent years before him and the so-called Delors report (Committee for the Study of Economic and Monetary Union, 1989) and the Maastricht treaty (Commission of the European Communities, 1992) also increased academic interest toward the topic. Tavlas says that the 'new' theory is faithful to the traditional approach as a starting point and follows the methodology and above-mentioned criteria in constituting a single currency area. The 'new' indicates that a few points make a fixed exchange regime a bit less costly and a bit more beneficial than it was viewed earlier (Tavlas, 1993).

Firstly, in the traditional approach, it is assumed that the trade-off between unemployment and inflation is permanent. Thus, a desirable point on the Phillips-curve is achieved through a flexible exchange rate policy, but the curve itself cannot be escaped. Gradually, as the subject developed, the assumption got refuted. First, the Friedman-Phelps hypothesis demonstrates that steady-state unemployment is not related to steady-state inflation when the Phillips relationship includes a variable representing the expected inflation rate, *id est*, an augmented Phillips-curve. (Tavlas, 1993.)

Secondly, Robert Lucas's work on unemployment and inflation relationship shows that even in the short run and under perfect conditions, anticipated changes in policy do not have an impact on real variables. Perfect knowledge of money stock changes does not affect supply or employment variables (McCallum, 1989, pp. 187). Thirdly, many countries suffered from rising unemployment associated with rising inflation in the 1970s and early 1980s, which is against the Phillips-curve concept.

As mentioned in chapter three, works of Barro and Gordon (1983) and earlier Kydland and Prescott (1977) pointed out that a high-inflation country is not imprisoned on its Phillips-curve, but it can by decision adopt a fixed exchange rate from some other country that can maintain credibility and low inflation. This is a major feature of Tavlas's 'new' OCA-theory. The traditional approach assumed the country-specific position of the Phillips-curve as somewhat given and structural and therefore a similar inflation level must be considered as a precondition for optimum currency area.

Inflation disadvantages such as; money's declined role as a store of value, uncertainty over future prices, and menu costs are widely known. (Tavlas, 1993.)

Constant high inflation indicates that monetary authorities and government policies of a country are neither stable or credible. Bad reputation from inflationary policymaking leads to a long and costly process in case the country desires to achieve a low inflation level by itself (De Grauwe, 1992; Giavazzi & Pagano, 1988; Mélitz, 1988.)

Barro and Gordon (1983) and also De Grauwe (2018, pp. 41–49) argue that the disinflationary process must be time consistent. This means that policymakers have an incentive to execute short-term policies such as electoral terms, which will reduce unemployment under the NAIRU level. Economic agents know this and most likely adjust their expectations of inflation. This continues as long as the inflation level equals the NAIRU unemployment level on the Phillips-curve. In other words, policymakers might cheat votes by practicing policy that reduces unemployment but results in inflation. A drawback is that policymakers lose their credibility, which will complicate the attempt of honest disinflationary policy in case they desire to practice it. The public will not believe that policymakers are willing to maintain a low-inflation policy unless they provide evidence about it. If the announced plausible policy does not function, the public and economic agents will adjust their inflation expectations, again leading to higher inflation than would be possible to achieve. The policy is not time consistent and lacks credibility. This especially makes the disinflationary process long and arduous. Also, if the public accepts the assertion as it is announced, the policymakers have an incentive to renege it and the vicious circle keeps ongoing. (Tavlas, 1993.)

The other way to gain credibility is the currency substitution that is introduced in chapter three. A high-inflation country forms a monetary union with a low-inflation country, but in the way that the credible low-inflation country is dominant and controls the monetary policy. Otherwise, the high-inflation country might bring its inefficient policy into monetary union. If the formation is appropriate, neither of the countries has to bear long-term costs from it (De Grauwe, 2018 pp. 41–49; Giavazzi & Giovannini, 1989 pp. 86–104). Inevitably, the countries might vary adversely in the long run, increasing the costs of monetary unification but it is not related to the formation. In

turn, the high-inflation country immediately gains the advantages of low inflation from the monetary union (De Grauwe, 1992).

De Grauwe gives an empirical example of credibility borrowing or 'tying the hands' as he says, from the unification of Germany. Due to economic liberalization in 1990 East Germany was hit by a shock declining the aggregate demand for East German and additionally East European products. According to the traditional approach, East and West Germany did not form an optimum currency area and East Germany would have been better off if it had implemented the economic reform while having an own currency in use and kept it for some time. Theoretically, exchange rate adjustment would have dampened the negative demand shock and according to De Grauwe, many economists were skeptical towards the German monetary integration for this reason. Emigration from East to West was intense which indicates that a high level of mobility occurred which in turn supports the old theory according to which East and West Germany would form an optimum currency area. On the other hand, labor mobility was almost exclusively from East to West and the movement of East Germans was restricted. Also, labor mobility could have been an expensive way of adjusting, because the emigrants were mostly young and skilled. East Germany would have depopulated its most efficient workforce, which would have led to a decline in already low productivity. In a monetarist view, East Germany would have benefitted from a monetary union, as devaluation and exchange rate adjustments are seen inefficient and illusionary. The Keynesian view would have been contrary to this and the traditional approach mainly rests on it, but the theory is influenced by monetarism too. To illustrate, McKinnon was afraid of the absence of money illusion in small and open countries. (De Grauwe, 1992.)

Nevertheless, both East and West Germany did unite despite what the traditional approach says. In 1991 industrial production declined by 50% and inflation rose by 5% in East Germany. At the same time, Poland was undergoing a similar economic liberalization program but without monetary integration. For comparison, Poland's industrial production declined by 19% and inflation rose by 250% in the same period. The numbers can be interpreted in a way that East Germany suffered from an immediate negative output effect more than Poland. This gives some support to the traditional approach stressing the costliness of asymmetric shocks and in that case,

own currency can be useful for adjustment purposes. Whatsoever, the evidence is not that unambiguous and the overall liberalization process might have been quite divergent between these two countries. The unification of Germany was implemented rather fast. Another difference, in addition to monetary integration or its absence, between East Germany and Poland was fiscal transfers. Large subsidies from West Germany to East Germany led to an increase in disposable income, despite the industrial production fell by 50%. Without the budgetary transfers from the West, East Germany would have fallen into a deep depression. Most likely Poland would have experienced the same. This emphasizes the importance of active fiscal policy between the regions within a monetary union at least in the case of Germany. According to the traditional approach, there has to be some kind of automatic adjustment system for satisfactory monetary integration. Germanys had fiscal transfers and therefore can be concluded that they form an optimum currency area. (De Grauwe, 1992.)

East Germany was not a high-inflation country, but during and after the liberalization process it probably would have been if it would have not adopted the credible and stable West German currency. After an elimination of price controls on basic commodities, the initial effect of economic liberalization tends to significantly increase the prices. The numbers again support the proposition as Poland's inflation was 250% and East Germany's only 5%. The new approach suggests that a monetary union with a strong and credible country is a less costly and, in some cases, the only way to reach a low inflation level, provided that the government and monetary authorities are not truly capable of achieving it by themselves. (De Grauwe, 1992.)

The second point Tavlas wants to put forth is labor mobility under uncertainty. He refers to Bertola's (1989, pp. 95) microeconomic research on costly reallocation under uncertainty and the result is that the more uncertain the environment, the less should be the willingness to undertake adjustments. The model has been applied to Mundell's factor mobility concept and can be concluded that uncertain income reduces the willingness to move to another location even if the initial location has uncertain income as well. This is due to the fixed costs of moving between the two locations. The economic agent fears that if she in future moves back to the initial location, the wage differentials might be unfavorable and the migration will be costly. Another issue is that if they are in the new location with a significantly higher income level, it will

induce others to move there and consequently the earnings will decline, which leaves the economic agent worse off. In its entirety, income level variability is generally a negative phenomenon. Bertola proposes with the Mundell-Fleming model, that asymmetric shocks between two regions increase income variability under the fixed exchange rate regime. The solution is flexible exchange rates, so national monetary policy can be used to stabilize the income level differences and therefore activate labor mobility between the regions. The ultimate argument is that flexible exchange rates are an instrument against asymmetric shocks and a single currency regime can be adverse if the regions are economically too different. This proposition is familiar from chapter one. (Tavlas, 1993.)

Tavlas's third point is that exchange rate adjustments do not affect trade flows as fast as it was assumed in the traditional approach. The adjustments work appropriately, but there are lags between a new rate policy execution and the real effects in trade flows. Contemporary researchers such as Krugman (1991b, pp. 17) note that the lags are longer than previously expected or realized. The proposition can be rationalized for example with the portfolio-balance model. Economic agents are assumed to prefer domestic bonds over foreign ones because usually, they are more effortless or convenient to hold. An enduring current account deficit scares investors away and the country has to pay a higher risk premium for the government bonds to induce the investors back. As the investors tend to avoid remarkably risky bonds, the demand for domestic financial instruments declines and the demand for foreign financial instruments rises. Under perfect foresight, the current account affects the exchange rates through the risk premia paid on the bonds. The adjustment process is probably lengthy due to the cumulative movements of the current account. In other words, it depends on how willing the investors are to accept the higher domestic risk premia, or do they prefer the foreign financial instruments denominated in foreign currency. If a perfect foresight is realistically not present, then conditions for speculative bubbles arise, as exchange rates do not properly follow the economic fundamentals, but psychological factors. (Tavlas, 1993.)

De Grauwe takes the argument of disconnected exchange rates and trade flows a bit further. He adds the hypothesis of Ricardian equivalence[9] to macroeconomic exchange rate dynamics. The expansionary fiscal policy reduces taxes and increases government spending. Consequently, according to the IS-LM-FX model, exchange rates should appreciate as the domestic interest rate rises, due to higher demand for financing. Under perfect foresight and Ricardian equivalence, economic agents know that the reduction in taxes and the increase in government spending will eventually lead to a budget deficit and the actions must be reversed. The expected future exchange rate depreciation will be instantly reflected with the present exchange rates and the ordinary appreciation does not take place in the first hand. The result indicates that the country's fiscal policy is completely ineffectual to control the exchange rates, but indeed perfect foresight and Ricardian equivalence are harsh assumptions and rather serve as an illustration. If these assumptions are loosened, the dynamics of the IS-LM-FX model becomes valid, but likely with lags, that are longer than was earlier thought. (De Grauwe, 1989, pp. 157.)

As the second and later the third stages of the EMU were approaching in the late 1990s, the focus of the scientific community somewhat shifted from theoretical pondering to empirical research under a presumption of the traditional theoretical framework. The single OCA preconditions of the traditional approach merged into a comprehensive economic integration between regions, which is a measure of optimum currency areas. Hence, this measure is used slightly differently in empirical research of 'Is area X an optimum currency area?', but the main point is that the majority of economists no longer debated the fundamental principles. Labor mobility, fiscal integration, trade integration and the rest were generally accepted as factors for a successful currency area. Although, some sporadic economists still wanted to speak out their opinions about the old OCA-theory. For example, McKinnon (2000, 2004) compared the decades-old theories of Mundell, even though the only real application under the concept of optimum currency areas was already implemented in the final stage of the

[9] Ricardian equivalence is a hypothesis according to which consumers consider the government's budget constraint in their decision making in a way that the method of financing the government spending does not have an influence on private consumption. Hence, debt-financed government spending is ineffective. See Barro (1974) and Buchanan (1976).

EMU. Concerning the 1990s empirical approach, see Bayoumi, 1994; Bayoumi & Eichengreen, 1993a,b, 1994, 1996, 1997; De Grauwe & Vanhaverbeke, 1993; Eichengreen 1991; Fatás, 1997; Fidrmuc & Korhonen, 2001; Frankel & Rose 1996, 1998; Karras, 1996; Ricci, 1997a,b; Stockman, 1988. These papers, such as many others around the subject try to either downright acknowledge whether there are certain regions or countries together an optimum currency area or bring forth discussion with some empirical findings.

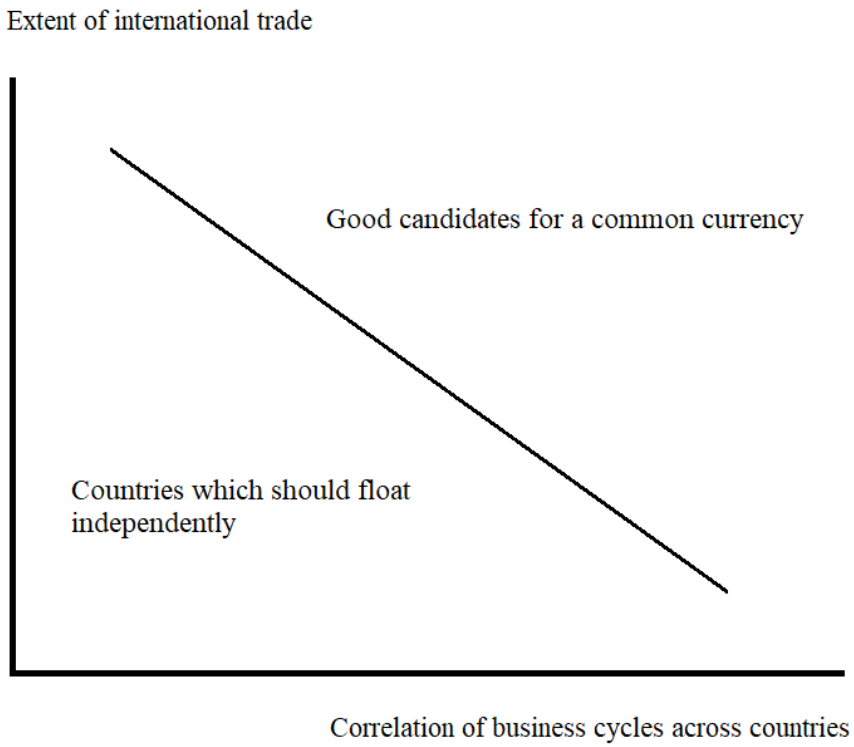

Figure 1. Business cycle symmetry, trade integration and the monetary regime (adapted from Frankel & Rose, 1998).

Frankel and Rose (1998) list that; the extent of trade, the similarity of the shocks and cycles, the degree of labor mobility, and the system of risk-sharing are the four inter-relationships between the potential members. In contemporary empirical research, these attributes were seen as given and were not questioned as during the traditional era. In figure 1 Frankel and Rose illustrate their views on the optimal exchange rate regime with respect to the extent of international trade and symmetry of shocks. One can notice that up to a certain point the mentioned attributes are interchangeable to cross the downward sloping OCA-line. Currently, the European Union consists of 27 member states. It is uncertain whether all the EU-countries form an optimum currency

area, as economists have varying views on the issue. De Grauwe (2018, pp. 77) locates EU28 (pre-Brexit) below the OCA-line on his similar graph in which the international trade is replaced by flexibility. The United States lies above the line, due to a high level of labor mobility and often plays a role as a benchmark in the literature. Eichengreen (1991) compares Europe to the United States and Canada and implies that even the initial EU15[10] does not form an optimum currency area. On the other hand, Artis and Zhang (1997) find that currency peg in Europe induces symmetry in business cycles and therefore countries would benefit from monetary union membership, provided that the predominant country is economically strong for example Germany. Nevertheless, not all economists shared the same view of economic integration being univocally positive. For example, Krugman (1991a, 1993) thinks that economic integration between regions leads to a high level of specialization, that expose the regions for asymmetric shocks. Krugman is certainly not alone but primarily the contemporary empirical research was and still is based on the view that economic integration in some form reduces the harmful asymmetric shocks and therefore it is a factor of optimum currency areas.

[10] The EU15 comprised the following 15 countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and United Kingdom.

5 FINLAND IN THE EMU

The implementation of the euro currency in 1999 instituted the first real monetary union in which various countries with different languages and cultural backgrounds use one common currency. Previously monetary integration has attained only currency pegs, substitutions and other more lightweight versions between the countries. The fresh currency area drew attention among economists and was exposed to criticism. This criticism questioned whether the Euro area in effect brings the benefits, that the European Commission's One market one money - report (1990) nearly promised. For instance, economists such as Feldstein (2000) and Krugman (1998, 2000) have been skeptical or even confrontational towards the euro. Jonung and Drea (2010) have written an entire paper mainly about US academic economists' pessimistic views on the single currency in Europe during the 1990s. According to the authors, the US economists were using the traditional optimum currency area paradigm and thus found Europe as a weak basis for a successful monetary union. Labor mobility in Europe was viewed as inferior compared to the United States and especially the lack of sufficient cross-border fiscal transfers was the reasoning for the pessimistic attitude. This advocates the before mentioned argument, that the EMU or single currency in Europe was principally a political decision with only little economic rationalization. However, the literature on the early 2000s optimum currency areas is not only criticism and analysis of the euro. De Grauwe (2018, pp. 92–99) writes about research that contemplates the possibility of Africa, Asia or Latin-America forming optimum currency areas in their corresponding regions. Most likely the establishment of the EMU has induced the research on other continents.

In this thesis, the interest is not in the entire Eurozone or the policy of the European Central Bank, because Finland has little to nonexistent power to influence these. Finland cannot choose what countries are members of the Eurozone or realistically affect the common monetary policy. Even if it could, Finland should in principle pursue benefits for the entire Eurozone and not only for itself. In other words, the combination of the member countries or monetary policy of the ECB can be viewed as exogenous factors in any case. In this matter, it is unreasonable to take a deeper look into the ECB or analyze whether the Eurozone forms an optimum currency area so that the interest rate and the configuration of member states are considered as given. Within

this framework, Finland can either choose to stay in the Eurozone or resign from it and reinstate the national currency, given that Finland is willing to maximize its economic utility. Probably this issue remains unanswered here, but some interesting viewpoints may arise.

5.1 Background

Finland's decision of joining the third, final stage of the EMU was made on the 17th of April 1998 by votes of 135–61 in the Finnish parliament. The government perceived that it is Finland's benefit to be among the first 11 members of the Eurozone in the core of the European integration. For example, the contemporary financial minister and current president of Finland, Sauli Niinistö, said in the media that it is inevitable to be among the first (mtv3, 1997).

According to Karttunen's doctoral dissertation, the elites in Finland and the EU15 states were supporting European integration more than the public. The Finnish political elite is composed of seven different categories: political, administrative, business, social partners, media, science and culture (Ruostetsaari, 1992). For instance, chairpersons of political parties, leading officials of ministries and in the Bank of Finland as well as other state-owned institutions belong to the categories described above. Karttunen's data states that 68% of the Finnish elites were in favor of the EMU whereas the count of the public was only 29%. Corresponding numbers for the EU15 states were 85% for the elite and 51% for the public. The results are not unusual. Gabel's (1998) empirical analysis on the Eurobarometer statistics indicates that people with low income and low interest in politics perhaps tend to be against European integration or at least not support it. Katz (2001) also concludes that the European elites are more into the integration compared to the mass. (Karttunen, 2009.)

Karttunen continues his statement about political elitism. According to him, political power is often in the hands of a few decision-makers, which are influenced by strong interest groups and parties. The leftist parties usually cooperate with trade or labor unions while agrarian parties collaborate with farmers' unions and rightwing parties with employer organizations. The most eager supporters of European integration are among internal party elites who have cosmopolitan experiences and special knowledge

in relevant subjects. Thereby, these elites are more aware of the consequences of integration and have a personal interest behind it. Nevertheless, political parties stand for their core supporters, hence the voters, so the public should have an impact on decision making. This does not yet mean that polarization is not a real issue in politics. Another noteworthy point is that a close relationship exists between a party's stance towards European integration and the party's current position in parliament. The parties in the government or with long experience of being in the government, have mostly supported the integration, whereas the opposition parties have criticized it. (Karttunen, 2009.) In fact, this observation might be a bit obsolete in the modern political field, in which European integration receives criticism and support from right to left.

The economic benefits of the EMU or monetary union, in general, have already been examined, but in regards to them, Karttunen (2009) points out that the recent academic literature from the 1990s and the economic logic of costs and benefits behind it, could explain why the EMU was launched in the 1990s. The benefits of a single currency could outweigh the loss of floating exchange rates. Paloheimo (1995, pp. 113–127) suggests that even so the economic interests were not the most important reasons for Finland's EU-membership. The problems and probably fears of security due to historical reasons weighed more.

Katzenstein (1985, pp. 47) writes that small European countries tend to choose strategies for security that suit in line with their strategies in economic matters. In turn, Karttunen (2009) mentions interlocking crises of the 1930s and 1940s such as; economic depression, fascism or World War II that influenced the politics in small European countries. Later the pressures of the Cold War and NATO membership emerged. "In general, historical experiences influence the EMU policy of a political party: the more unsupportive historical references there are, the greater the tendency to oppose a supranational policy" he writes (Karttunen, 2009, pp. 26). The Maastricht treaty and its implementation later, the EMU was essentially a German plan (Moravcsik, 1993, 1998). De Grauwe (2018, pp. 165–178) is mostly on the same line. The German model of central banking surpassed the Anglo-French model and became a prevailing approach in the ECB. The former focuses on price stability as its main objective and operates independently from political authorities. The latter has various

objectives and takes orders from the minister of finance instead. Along with economic reasons, the Germans had a particular strategic position in the EMU process. Karttunen proposes that the EMU was initially a part of a wider historical package deal between Germany and France. It seems that the major British, German and French parties have had a significant role in the European integration process (Johansson & Raunio, 2001, pp. 230). Furthermore, external authorities such as the United States have supported European integration after World War II in fear of socialism and anti-American policies, Karttunen adds.

5.2 Jukka Pekkarinen EMU-report

Finland has had a significant benefit from an active national monetary policy during the period after World War II up until the euro. The role of monetary policy instruments intensified when Finland began an open trade with the EU and other EFTA states. Devaluation has been a regular and systematic part of Finland's economic policy and this has retained its competitiveness. (Karttunen, 2009.) Moses (1998, pp. 94) suggests that monetary policy instruments have contributed to the Finnish economy probably more than any other European country. After 1945 Finland has had eleven devaluations, three revaluations, and one period of floating exchange rate to correct inflation and instability cycles (Boldt, 1999).

Devaluations were practically executed in ten-year intervals to escape from these self-induced recessions. The devaluation cycles were later viewed as rather harmful as they boosted certain export industries to the detriment of other sectors (Kiander, 2001). Korkman (1978, pp. 357–366) writes that the concept of a devaluation cycle was even introduced by Finnish economists. The tradition of exchange rate changes goes back to the early 1900s when Finland withdrew from the gold standard and let the markka decline in 1914 and consequently a few years later avoiding an international depression. Devaluation worked again in the 1930s Great Depression and Finland could bypass the hardest times and rebuild the economy (Moses, 1998, pp. 84). In 1991 Finland fixed the markka to the ECU but only a few months later it had to devalue the currency due to liquidity issues from the banking crisis. After this, the markka was let to float freely against other currencies. (Karttunen, 2009.)

The above-mentioned implies that the national monetary policy has been a huge benefit to Finland, and relinquishing it would probably be a costly action. One could argue that the economic cost of a common currency seemed probably higher to Finland than in comparison with some other countries. At the end of 1996, the contemporary prime minister Paavo Lipponen set up an EMU-committee to deliberate potential advantages and disadvantages of the common euro currency to Finland. The group consisted of 12 Finnish experts and academics of economics from universities and other institutions. The chairman was professor Jukka Pekkarinen and the report is known by his name as well[11] (called Pekkarinen report from now on). The report was groundwork for a separate Finnish government report, that was referred in political decision making on the subject[12].

Because of the short time frame, the Pekkarinen report was finished just in few months and therefore lacks deeper detailed research and quantitative analyses. The report neither provides a comprehensive conclusion about the solution the economists suggest to policymakers. The purpose of the committee was advisory and not to promote any political position. In fact, Pekkarinen was the economic policy advisor of the prime minister Lipponen, which obliged the committee to abstain from explicit recommendations.

However, it is said that the report had an important role in two major parties' decision making concerning the EMU. According to Karttunen (2009, pp. 98), the contemporary prime minister and SDP party leader Lipponen stated that, "if the conclusion or recommendation of Jukka Pekkarinen's group had been clearly critical, it would have had a tremendous influence on the process". Moreover, the NCP party leader Niinistö claimed that, "if most of the expert reports had been sharply negative, then the party would have rethought its position" (Karttunen, 2009, pp. 99). Also, Karttunen writes that economic goals were by far the most important EMU issue among the three major parties. Other issues were for instance, democracy and

[11] 'Jukka Pekkarinen report' officially in Finnish *Rahaliitto ja Suomi – talouden haastee*t (EMU-asiantuntijatyöryhmä, 1997).
[12] See Valtioneuvosto (1997). The government report is know as Talous- ja rahaliitto – Suomen vaihtoehdot ja kansallinen päätöksenteko, Valtioneuvoston selonteko eduskunnalle 20.5.1997.

internationalism. Based on this, it seems that to some extent politicians considered the OCA-theory and international economics at least indirectly via economists.

On the other hand, Koskenkylä (2016) claims that entering the last stage of the EMU was practically certain and an automatic sequel to the EU-membership from 1995. Also, Kiander (2019) states that the Maastricht treaty in truth required Finland to join the EMU. Only Denmark and the UK had permission to postpone the EMU membership he continues. This brings up the question that did the Pekkarinen report have an impact after all, if the decision was already nearly made behind the scenes. Was the early adoption of the euro obvious to the major parties in a way that economic statements did not have actual weight? Perhaps not, but seemingly for example Sweden was more deliberative about joining the monetary union than Finland. A concrete example is that Finland did not have a separative referendum of the EMU unlike Sweden and Denmark (Koskenkylä, 2016). Possibly the political elites wanted to rush into the monetary union without inquiring the public opinion because being among the first states was seen as greatly valuable. Another example is that Sweden's Calmfors EMU[13] report is way more exploratory and detailed compared to the Pekkarinen report. The former has a cost-benefit comparing analysis, whereas the latter settled for more conversational form.

The Finnish EMU-committee acknowledges the difference and says that the Calmfors report has been useful for the Finnish investigation as well (EMU-asiantuntijatyöryhmä, 1997, p. 15). The Swedish even have foreign viewpoints, for example, McKinnon and De Grauwe, that probably are rather unbiased. An American economist probably does not have a personal interest in whether Sweden or Finland has the euro or not, which is not a case with domestic economists. One could say that foreign academics favor the theory as opposed to domestic experts and decision-makers who aim at the comprehensive national wellbeing, in which politics play a greater role. Nevertheless, for some reason, the Finnish prime minister assigned the EMU-committee rather late, and the Pekkarinen report remained as the only official investigation about the significance of the EMU (Koskenkylä, 2016). Therefore, the

[13] See Calmforsrapporten SOU 1996:158 (Calmfors et al., 1996).

report is an important part of the Finnish process in European integration and serves as an economic foundation for the EMU-membership, which now has continued for about two decades.

The outsiders do not know how intense was the political game between the parties and interest groups or what was the factual weight of the economic investigation. It does not genuinely matter, because at present Finland is and probably stays in the Eurozone and in addition, the Pekkarinen report yet offers an economic perspective from the Finnish experts of their time. Hence, the report is worth taking a deeper look into it. Below are the the main points of the report that represent views from the Finnish economists in 1997.

5.2.1 Path to the euro

European integration, as it is perceived today, began in the 1950s after World War II. The first official implementation of that was the European Coal and Steel Community, which was established to obtain common markets for coal and steel. In addition, the organization comprised wider security and social-political objectives for rebuilding post-war Europe, even if they were not officially stated. The original member states of the ECSC were so-called “Les Six”, which are Germany, France, Italy, Belgium, Luxembourg, and the Netherlands. These countries combined the core of European integration. A bit later, in 1958 the European Economic Community was founded (EEC), which in 1967 merged with the ECSC and the European Atomic Energy Community (Euratom) and became the European Community (EC). (EMU-asiantuntijatyöryhmä, 1997, pp. 21.)

Finally, in 1993, after signing the Maastricht treaty, the European Community became the European Union (EU). At the time when the report was written, the EU could be described as intergovernmental multilateral cooperation and decision-making. By common agreement, the member states have relinquished part of their sovereignty (not just monetary policy like with the euro and ECB) to the supranational organs. Some sectors are more regulated than others. For instance, decision-making and control of the European internal market are highly supranational. Maastricht treaty meant quality majority voting within the union, but the basis of integration remained rather

unchanged. During the negotiations, suggestions about federal integration were rejected. The main activity of the EU is still concentrated in the member states and there aren't any political controls and supervision, that are typical for federations. (EMU-asiantuntijatyöryhmä, 1997, pp. 22–25.)

European economic integration began in the 1950s as well, but nothing concrete was implemented or agreed before signing the Maastricht treaty. The Finnish EMU-committee mentions two main schools, the economists and monetarists of how financial integration should proceed. Monetarists believed in a stable currency, which would bring the member states closer in terms of economic policy and -development. In addition, a stable currency would generally increase financial and political integration. Economists instead thought conversely that stable currency can be achieved only with inevitable economic integration between the member states. If the integration is insufficient, economic differences among the countries will eventually break the currency peg or lead to greater regional problems. (EMU-asiantuntijaryhmä, 1997, pp. 23.)

An idea of the European monetary union was proposed as early as 1962, but the plan did not succeed. Later, along with the problems of the Bretton Woods, member states of the EEC decided to begin a progressive path towards a monetary union. In 1970 the so-called Werner Report (Commission of the European Communities, 1970) covered these issues and the objective of the report was to achieve a monetary union before 1980. The collapse of the Bretton Woods, the 1970s oil crisis and the inflation it caused and currency instability problems abolished the project. Also, free capital movements were seen as a potential threat that needed monitoring and responsible administration. Consequently, the European Monetary System (EMS) was established in 1979 to aim at lower instability between the currencies. At the same time the European Exchange Rate Mechanism (ERM) and the European Currency Unit (ECU) were launched. In practice, these acronyms meant a benchmark basket currency for the participant countries and only moderate fluctuations from that were allowed. National central banks agreed to practice policy that kept the domestic currency within the tolerance of the ECU. This is an example of a lighter version of monetary integration mentioned in the introduction. Finland was not officially a participant until 1991. (EMU-asiantuntijaryhmä, 1997, pp. 23–25.)

In the late 1980s, new motives arose to take economic and monetary integration further. It was viewed that the full potential of internal markets cannot be reached due to exchange rate risks and commissions of different currencies. This argument can also be found from the European Commission's One market, one money - report. The other issue was a combination of contractual currency peg (ECU) and free capital movements, which were rather an unprecedented reform. This tempted for speculative attacks, as the currency was not 'hard-pegged' but jus agreed to not fluctuate freely. Therefore, internal markets required a common currency, that would prevent speculative financial activity. The third issue was Germany's strong position in the EMS. Ultimately Germany's Bundesbank had indirectly control over the European monetary policy, as the strong and reliable deutschmark became *de facto* target currency in the EMS for the other countries. The Bundesbank's monetary policy defends the interests and benefits of Germany and this can be problematic for the other member states if they happen to be in a different economic situation than Germany. Also, a loss of sovereignty to other countries is often viewed challenging as such. The idea of cure was to shift monetary power from Germany to a supranational central bank. The asymmetry in monetary power within the EMS provoked especially France to set up a committee to solve the above-mentioned issues. This is known as the Delors Committee and its propositions were a basis for the economic part of the Maastricht treaty. In addition to this, Delors Committee recognized the possibility for a common currency, yet as a distant objective in the future after deep financial integration. The Maastricht treaty focused on implementing concrete institutional solutions. From the treaty a progressive process of the EMU began, in which the third, final stage was to put new currency into effect. (EMU-asiantuntijaryhmä, 1997, pp. 25–29.)

The EMU-committee thinks it is possible that in 1999, the EMU will loosen the convergence criteria[14] of the Maastricht treaty so the number of member states will not be too small. Baldwin and Wyplosz (2015, pp. 350) also argue against small monetary unions. The more people accept a currency, the more useful it is, they write. The general weak economic growth makes it difficult to reach the criteria, but also political factors may have an effect in order to obtain enough member states when the euro

[14] The convergence criteria are comprised of numerical requirements for inflation, budget deficit, debt-to-GDP ratio, exchange rate stability and long-term interest rates.

launches. For the future of the union it would be problematic if all the Mediterranean countries were rejected because they cannot fulfill the criteria. On the other hand, if economically insufficient countries are let into the monetary union, it might reduce the economic potential of common currency below what was first predicted. Credibility of the union takes a hit if something commonly agreed is immediately loosened. Furthermore, if the final stage of the EMU is postponed, it is also against the Maastricht treaty and indicates that participant states cannot hold on their economic promises. (EMU-asiantuntijatyöryhmä, 1997, pp. 31–33.)

With respect to Finland, the EMU-committee believes that is is among the member states that fulfill the convergence criteria. Reasoning for an early attendance of the last stage of the EMU lies in authority. Member states that participate the monetary union in the first wave, have power to define and affect policy of the union. The political elites saw this as a very important feature and opportunity. In a role of late-joiner, all the early policy decisions of the union are already made and the leaderboard positions filled. On the other hand, if joining was made later, Finland would have received experience on how the monetary union works in practice for example the currency stability and other policies, and how to get prepared for them. (EMU-asiantuntijatyöryhmä, 1997, pp. 34–36.)

5.2.2 Utility of the monetary union

The EMU-committee divides benefits of monetary union into two segments. The first are microeconomic effectivity increasing factors and the second are related to macroeconomic stability. The concrete benefits are basically the same as introduced in chapter three. The knowledge of costs and benefits have been established for long and on a theoretical level the validity is not often questioned. A larger issue is to determine a degree of costs and benefits. However, according to the report, Research Institute of the Finnish Economy (ETLA) has estimated that the GDP benefit for Finland from the absence of foreign exchange market inside the Eurozone is 0.1%, in case Sweden and the UK participate the monetary union as well. (EMU-asiantuntijatyöryhmä, 1997, pp. 37–38.)

Costs related to protection against exchange rate risks would decline a bit more. Sweden ended up having somewhat similar numbers in their estimates. The Finnish committee emphasizes that for the potential benefits it is crucial that Sweden and the UK are part of the monetary union, as Finland has lots of trade with them. ETLA also estimates that common currency reduces all operating costs of firms and households by 0.5% of GDP if Sweden and the UK are again participating the union. (EMU-asiantuntijatyöryhmä, 1997, pp. 37–38.)

The committee mentions that especially small countries like Finland benefit from a common currency more than greater ones. For instance, small currencies may look illiquid and come across as risky investments compared to the franc and deutschemark. In an ideal situation the overall average GDP advantage is estimated to be 0.4% and for small open countries 0.9% of GDP. It is noteworthy that these are just rough estimates and serve as some kind of numerical value for the potential benefits. Along with a common currency, Improvement of capital markets will probably also reduce the difference between banks' deposit and withdrawal rates that vary a lot among the EU-states. Though Finland does not suffer from this as much as Southern European countries. In addition, the economists evaluate that foreign trade will increase and especially small and medium size enterprises benefit from it. (EMU-asiantuntijatyöryhmä, 1997, pp. 38–41.)

The committee brings forth the OCA-theory and mentions that the convergence criteria of the Maastricht treaty is aimed to prevent too extensive asymmetry within the monetary union for a common monetary policy to be effective. Economists are afraid that real economies between the member states might still vary too much, even if the convergence criteria were fulfilled for instance in industrial sectors. The committee places the EU15 below the OCA-line in the graph of asymmetry with respect to adaptability, indicating that the EU15 might be too heterogeneous for joining the union in the third stage of the EMU. Instead of that, the core countries of Europe such as Germany, France and Netherlands already have a lot of trade with each other across the sectors. Hence, an economic structure of these countries is more integrated among themselves than with the countries in periphery. As a result, a smaller monetary union of the central countries would probably not be too heterogeneous to succeed at least in theory. (EMU-asiantuntijaryhmä, 1997, pp. 43–46.)

An opportunity of floating exchange rate is not much discussed in the report, but the economists of the committee do not necessarily find it as an absolutely positive counterpart to fixed exchange rate for its role as a monetary policy instrument. Freely floating exchange rate can be used against asymmetric shocks, but only if the entire economy is affected, not just one sector. Also, as mentioned earlier, floating exchange rate might be the root for instability, not a cure to it. The committee acknowledges that the fixed versus floating exchange rate regime is one of the major questions of economics and is very difficult to be answered. (EMU-asiantuntijaryhmä, 1997, pp. 43–46.)

Regarding Finland, monetary union can provide a lower, more unified real interest rate. Finland has periods of rapid inflation, devaluations and general instability in its financial history. This reflects to real interest rates, which have been higher in Finland than in Germany or Sweden for instance. As the interest rate is viewed to have a direct relationship with the stability of government debt and willingness to invest, a low rate would be beneficial. The committee believes that the interest rate within the union is generally lower than outside of it and the benefit appears essentially in the long run. (EMU-asiantuntijatyöryhmä, 1997, pp. 49–51.)

5.2.3 Finnish economy and asymmetric shocks

According to the OCA-theory, a monetary union would be justifiable for the European center countries, but not for Finland, writes the committee. The committee proposes four historical reasons for asymmetry between Finland and the core of Europe. The asymmetry takes place between business cycles of total GDP. The first reason is that Finnish production structure and foreign trade are rather unilateral compared to large EU-countries. This applies to other Nordic countries as well, but for example, Sweden has recently approached the core states with its production structure. Traditionally Finland relies on lumber industry and now increasingly on metal industry as well. A crucial feature for the reduction of asymmetry would be a bilateral trade inside various sectors with the other EU-states. Not just exporting lumber and paper but importing cars and computers for instance. Hence, Finland would be better connected to a supranational monetary policy of the union central bank. (EMU-asiantuntijatyöryhmä, 1997, pp. 56–59.)

The second reason is extensive trade with the Soviet Union, which was not typical for the other EU-countries. The trade had an influence in Finland's business cycles. The third reason is Finland's historical inability to harmonize monetary policy, fiscal policy, and labor markets together. Inflation, devaluation, volatile competitiveness, and financial instability are consequences of this to some extent. In addition, the lumber industry has been trend-sensitive, so during the time the economy boomed intensively and *vice versa*. Also, important trading partners such as the UK and Sweden have occasionally practiced different monetary policies, and this has amplified the shocks in Finland. The fourth reason for asymmetry is the recent 1990s depression. Its basis lies in international markets, but various factors like the collapse of the Soviet Union and the liberation of the financial market happened at about the same time and affected especially Finland. Particularly the first reason is suitable for the OCA-theory thematics. Long-term unilateral production structure might stir up asymmetry in a way that Finland falls behind the supranational monetary policy. (EMU-asiantuntijatyöryhmä, 1997, pp. 56–59.)

The Bank of Finland has calculated the significance of different disturbances in the GDP of Finland. According to the model, exchange rates caused 28% of the historical GDP disturbances. The second was the trade with the Soviet Union by 18% and the third was interest rates by 11%. The rest 43% were deviations from the long-term trend that could be explained by other factors. The committee concludes that in addition to Finland's own decisions, the monetary policy of important trade partners has also had an impact on the economy. Again, if the UK and Sweden were to join the monetary union along with other Western-European countries, the exchange rate based shocks in Finland will probably greatly decline. There would be only the US dollar and Japanese yen left to quake exchange rates. The committee adds, that in years of 1971–1995, 44% of the GDP shocks have been caused by domestic factors. 36% of the shocks have originated from the non-central countries of Europe such as the frequently mentioned UK and Sweden. The results indicate that Finland is quite sensitive to trade with these union-hesitant countries. (EMU-asiantuntijatyöryhmä, 1997, pp. 60–63.)

5.2.4 Monetary policy in the Eurozone

According to the Maastricht treaty, the main objective of the ECB is to maintain price stability in the union. The treaty does not determine methods to achieve this objective so the ECB is given rather a free rein in that matter. Also, the ECB will be an independent organ from the political system and this stems from German central banking tradition. As mentioned earlier in this thesis, Germans have been successful in maintaining low inflation. The Finnish parliament is used to have the last word on national monetary policy, based on a banking law from 1925 (Pekkarinen, 1994). This guarantees legitimacy, but also might bear a political conflict of interest and lack time consistency. Regarding the ECB, independency comes with transparency and accountability of monetary policy. (EMU-asiantuntijatyöryhmä, 1997, pp. 72–75.)

The committee recognizes that as an outer country, Finland might suffer from common monetary policy of the ECB just like the theory suggests. Even if Finland did not join the upcoming monetary union, the monetary policy would probably still affect the external countries. The committee thinks that also national banks have an intention to determine their view of price stability and therefore follow the ECB monetary policy. The EU-countries that will not adopt the euro can join the new ERM2-system, which is a new benchmark currency that follows the euro. If the countries, at some point, desire to join the euro, they must adhere the ERM2 first. In other words, monetary policy of the ECB will likely prevail in Europe, regardless of whether acountry is a member state or not. The ERM2 is a consequence for Finland, if the monetary union and floating exchange rate regime will be rejected. Finland had a floating exchange rate during 1992–1996, and the experiences are rather positive. Even so, the period was too short for reliable criticism. Even with a floating exchange rate, the EU-countries would still probably pursue tight monetary policy, because deviant policy would be interpreted as loose and harmful within the EU. No matter what currency system, the EU-countries have agreed to target a smooth and an efficient common market. Low-inflationary monetary policy is here to stay. (EMU-asiantuntijatyöryhmä, 1997, pp. 72–90.)

The common monetary policy will probably succeed in dampening shocks, but the main responsibility remains in the participant countries. It will be problematic if the participant countries are too heterogenous and have different expectations for the monetary policy of the ECB. Not everyone can be satisfied, as there is only one policy in place. This concerns especially Finland that lies in the periphery of Europe, not only geographically but economically as well. Significant asymmetries among the member states build up a risky environment. Also, large fluctuations in the euro are challenging particularly if Finland joins the monetary union whereas the UK and Sweden would not. In particular this highlights the firm relationship between these countries. (EMU-asiantuntijatyöryhmä, 1997, pp. 90–91.)

5.2.5 Fiscal policy

Conditions for national fiscal policy in the monetary union are considered good. The common interest rate is determined by the ECB and fiscal policy of a small member state such as Finland, does not have any significant effect on the interest rate. Therefore, fiscal policy is a strong tool for stabilizing domestic business cycles, in case monetary policy does not exist. On the other hand, fiscal policy may have an externality in other countries, which can be negative. Expansive fiscal policy increases imports and stimulates the economies of other countries. If both countries are undergoing a downturn, then the total gain is positive, as the expansive fiscal policy of a single state revitalizes both. However, if the countries are in contradictory economic situations, the expansive fiscal policy just intensifies the boom in the other member state as a result and thus a harmful negative externality. The effect is worse with large countries, because borrowing starts to affect the interest rate, which can be adverse for member states in an upturn. Again, the issue is related to asymmetry between the participants in a monetary union. (EMU-asiantuntijatyöryhmä, 1997, pp. 93–94.)

Monetary union brings new challenges for the coordination of the common monetary policy, national fiscal policies, and other financial segments in order to react for business cycles and for the maintenance fiscal sustainability. The presumption is that fiscal federalism will not increase along with the last stage of the EMU. The member states are responsible for their own fiscal policy. Regarding the convergence criteria,

the committee finds that the budget deficit requirement is too emphasized. Due to budget automation, deficits greatly differ among the EU-countries, especially in the ones that have a large public sector. In business cycles, budget automation plays a dampening role. Progressive taxation weakens a boom and transfer payments weaken a recession. The committee says that temporary budget deficits from automation are not harmful for sustainability. Even a country with a slight debt may face temporary budget deficits, that are seen unacceptable in the Maastricht treaty. A more appropriate way to measure fiscal sustainability would be for example to compare employment and budget deficit. Paying attention to the deficits is simpler but does not sufficiently pay attention to stabilization activities in fiscal policy monitoring. (EMU-asiantuntijatyöryhmä, 1997, pp. 108–109.)

The committee recognizes the potential risk of accepting highly indebted countries into monetary union. High debts might threaten the entire union and its credibility. This has to be taken into account in 1998 and later with new participants. Greater is the debt, the more a new candidate country should provide information about its fiscal sustainability and ability to maintain it. Also, different properties of fiscal sustainability should be regarded, for example extensive pension obligations in future. Coordination of national fiscal policies will probably stay rather concise even though it would be desirable for stability of the monetary union. (EMU-asiantuntijatyöryhmä, 1997, pp. 108–111.)

5.2.6 About regions and taxation

Along the monetary union, integration will stress national tax bases, and this concerns especially countries with high taxation such as Finland. Integration allows more effortless movement of taxable assets between the member states and that likely encourages tax evasion. Therefore, the national tax bases will probably get closer and in Finland's case, there is pressure to lower taxation to correspond with other countries. Integration does not only affect taxation, but social security and services as well. This is a kind of continuation for declining income differences between European capitalist countries. On the other hand, labor mobility has increased little to none even though European countries have had significant unemployment differences since the 1980s. (EMU-asiantuntijatyöryhmä, 1997, pp. 121–123.)

Settling down permanently in a foreign country has not been common in Europe and thereby it does not help with long-term unemployment issues. The domestic labor mobility is a significant stabilizing mechanism instead. Urbanization will increase, whether Finland joins the monetary union or not. This applies to the entire Europe as well. In case the monetary union will decrease Finland's tax income, the rural and other areas with few residents will receive less resources from the government than earlier as a result. Subsidies that intend to maintain employment, services, and prevent recession will probably decline, but it is a part of urbanization as well. The committee is afraid that tax competition between the countries will push the general tax base very low. (EMU-asiantuntijatyöryhmä, 1997, pp. 123–126.)

Integration means changes in financial structures and thus capital movements among the member states will be more effortless to perform. The committee suggests that there has to be a coherent unionwide tax system, or alternatively all interest income ought to be taxed also domestically even if the income was from foreign countries. In addition, integration will probably stress corporate, labor, and value added taxes as well and some kind of harmonization should be done. Asymmetry between tax bases will likely lead to an adverse outcome if member states do not cooperate in the matter. (EMU-asiantuntijatyöryhmä, pp. 128–130.)

5.2.7 Labor markets and unemployment

A new central feature, that especially Finland must adopt to, is the expected low inflation policy of the ECB. As mentioned earlier, both the upcoming Eurozone and consequently the countries exterior to it, will most likely meet with low inflation. Therefore, Finland has to adjust to new condition, whether it joins the union or not. Low inflation will restrict the amount that the average wages can rise in the economy or relative elasticities between different sectors and firms. Partly the adaptation process will automatically go forward, as tougher competition and free capital movements do not leave room for rise in wages. Also, national monetary policy is not available for revitalizing the weak competitiveness caused by relatively frequent and extensive rise in wages, which arguably reduces wage claims. (EMU-asiantuntijatyöryhmä, 1997, pp. 138–139.)

A generally lower interest rate and free capital movements should fortify companies' financial position, and this combined with smaller wage claims leads to the natural unemployment becoming lower. A concrete guideline to Finland is that nominal wage raises must be explicitly lower than they have used to be, because in a monetary union, the nominal raises shift almost directly into real income. It is assumed that in normal conditions productivity growth would be 2–3% per year. The ECB inflation goal will most likely be around 2%, which means that wage raises must remain in 4-5%. A safe rule of thumb could be that the wage raises equal productivity growth. In collective labor agreements wages have often risen more than agreed. The traditional high nominal pay raises from the past would lead to an increase in unemployment, but in a monetary union, these inflation spikes cannot be straightened with devaluations. Particularly the transition phase might cause problems and hence attention should be drawn to it. (EMU-asiantuntijatyöryhmä, 1997, pp. 138–139.)

There is a risk that in case wages rise justifiably in some sector, it will in consequence spread to other sectors that are not necessarily entitled for it. This may take place via supply chain and subcontracting or if the initial sector is regarded as a benchmark for wage bargaining in other sectors. In Finland this could be a case with cycle-sensitive export industry such as the lumber production and the rest of the economy. The issue emerges if general wage level rises together with major export industry during an upturn. Then, if the export industry falls into a downturn, the general wage level should decline as well but wages tend to shift only upwards, not downwards. Employees are not ready to give up acquired benefits. (EMU-asiantuntijatyöryhmä, 1997, pp. 139–140.)

The committee brings forth a contrary issue: Some industry sector might be isolated from other sectors that are under tight international competition. Wages and expenses are allowed to increase more in the isolated and sheltered sector compared to the rest of the economy, mostly because higher expenses can be shifted into product prices. In the short run this does not affect employment. In the long run instead, expenses will rise in general and the sectors with higher competition will suffer from this, which eventually harms the isolated sector as well. To conclude, in the future wage bargaining should be centralized and held on an institutional level, so trade unions

have to consider comprehensive effects in the economy. (EMU-asiantuntijatyöryhmä, 1997, pp. 139–140.)

Another matter is probably to accept higher differences of wage raises between sectors. It is important that wage raises In successful sectors would not spread all over the economy in an inflationary way. The crucial issue is inelasticity of nominal wages. Without nominal wages, a monetary union and its policy would not have a large impact on macroeconomy. In short term, nominal wage inelasticity is the link between unemployment and monetary policy. It is unclear weather it would somehow change in the monetary union, but as mentioned earlier, people tend to be strongly against wage reductions, even if the real income would not change that much. If elasticity of nominal wages would not increase in the monetary union, other adaptation mechanisms must improve or be improved in turn. For example, active labor policy that includes retraining and employment agency could be a substitute for the inelasticity. (EMU-asiantuntijatyöryhmä, 1997, pp. 139–146.)

5.3 2010s Finnish views

Sweden and the United Kingdom never joined the EMU. The Calmfors report did not support the EMU-membership for Sweden due to the high unemployment rate and the weak state of the public economy (Kiema, 2017). Sweden was not ready for the euro back then and later in the 2003 referendum the proposal of the membership was rejected. The UK has been on the same line where the support for euro currency has always been low among the British. According to the Pekkarinen report, this was the worst scenario for Finland due to the reciprocal trade and imported shocks among it. Pikkarainen writes that external asymmetric shocks have not been the largest threat in the union however. The problems are rather caused by internal differences in economic policy decisions and by domestic features such as overheating of the real estate market. On the other hand, there are underlying elements for asymmetric shocks in Finland, for instance dried-up electronics sector, structural change in the lumber sector and international oversupply in steel industry. Also, Finland has yet maintained a close relationship with Russia in terms of trade, which may bring forth its own issues. (Pikkarainen, 2014.)

Kiema (2017) agrees with Pikkarainen that the Pekkarinen report focused on asymmetric shocks and did not consider global symmetric threats. The 2008 financial crisis shook up the entire banking system and symmetrically threatened the entire Europe along with the most Western countries. The reason why asymmetric shocks drew attention in the report was probably because on theory, symmetric shocks are easier to deal with, whereas asymmetric ones are systematic and derive from fundamental differences between member states' economies. In Europe the financial crisis turned into a Euro crisis in which some Eurozone members, for example Greece, Spain, Italy, and Portugal faced huge public debts. Kiema says that the Euro crisis was somewhat predictable, but the ECB had no tools against it during the time. Inflation differences within the union led to differences in real interest rates, meaning that appropriate rate for Greece and Spain would be excessively high for Germany and Finland. This supports the theory according to which the member countries should be economically integrated for the best possible result. (Kiema, 2017.)

Pikkarainen states that the Pekkarinen report did not bring forth anything about the banking union, probably due to lack of time[15]. Also, no one could have expected such extensive economic threats to the monetary union, as the Euro crisis was. Generally, banking union means methods that prevent potential crises which would in turn push countries into deep debts. In addition, the objective is to achieve joint responsibility, in which indebted countries can get financing from the union. Suggestions for fiscal or even political union are not unprecedented either. Pikkarainen adds that the official Finnish government report gives a more harmonized picture of the monetary union than the Pekkarinen report does. The latter brought forth concerns about too loose compliance with the convergence criteria, whereas the government report did not emphasize the importance of Sweden and the UK for Finland. However, neither of the reports could see any critical crisis incoming. Hence, the challenges in the Eurozone are way more severe than was thought in 1997. On the other hand, the EMU-committee had an accurate conception of the principles of the ECB monetary policy before the implementation. Considering how fast the Pekkarinen report was

[15] For example, De Grauwe (2018, pp. 142, 187–188) and Eichengreen (2014) view banking union as a requirement for a successful monetary union especially in the Eurozone, where most cross-border capital flows are carried out by banks and are strictly following economic cycles, see Allen et al. (2011).

concluded, it gives a rather satisfactory evaluation of the benefits and costs of the EMU. (Pikkarainen, 2014.)

Kiander has assessed the first ten years of the EMU thoroughly. First of all, the convergence criteria actually did not have much weight. Countries such as Italy, Belgium, France and a bit later, highly indebted Greece, were accepted to the EMU, even if they exceeded the maximum debt criterion of the Maastricht treaty. Germany protested Italy's membership because its debt was seen as a threat to stability in the monetary union, but with support from France, Italy was accepted as well. Politics had a larger role than the mutually agreed criteria. Another regulation that had to be broken was the no-bailout rule, that prohibited direct financing of member states. This took place during the 2010s Euro crisis. (Kiander, 2019.)

Economically the first ten years were successful as the growth in the entire Eurozone was quite high and unemployment was in decline. Kiander says that the euro, the new currency, elevated mistrust in markets, making it cheap and thus imbuing the economies within the Eurozone, but still the more important factor for the growth was lower interest rates. Before the common currency, inflation and exchange rate risks caused a significantly higher interest rate in many countries compared to Germany. A decline in the interest rates divided the Eurozone into two groups; the countries with lower growth but higher deficit, and *vice versa*. These first mentioned net creditors were Germany, Austria, Benelux-countries, and Finland. (Kiander, 2019.)

Finland was among the winners of the of the EMU in the first decade. Consequences of the 1990s depression tuned the economy into export-oriented, which can be viewed as the key to Finland's success. Improved competitiveness, combined with the Nokia driven electronics cluster, led to great economic growth. GDP to debt ratio fell from 60% to 40% in one decade. (Kiander, 2019.)

The 2008 financial crisis and subsequently the Euro crisis caused significant damage to the Finnish economy. In 2009 GDP declined by 8.5% and exports by 30%. The extremely profitable Nokia turned out to be negative. Kiander writes along with the above-mentioned crises, Finland faced unexpected and huge asymmetric shocks, where Nokia and the lumber sector were probably the main victims. The economic

recovery has taken much longer compared to many other countries such as Sweden, Germany or Spain. Growth of the Finnish labor productivity basically just stopped. (Kiander, 2019.)

National monetary policy is not available in the EMU, so Finland did what it could and used fiscal policy for increasing domestic demand in order to recover from the crises. Raising the general retirement age, tax reliefs and moderate-income policy were also part of the program for achieving high competitiveness that was lost during the economic crises. Kiander says that the 2010s Finnish economic policy may be considered successful even if the growth has been poor. Hence, domestic demand and employment were kept somewhat stable in an adverse situation. The low-interest rate of the ECB contributed to Finland's fiscal policy, making the public debt inexpensive. (Kiander, 2019.)

Vihriälä proposes that from Finland's point of view, the economic costs of the EMU have been larger than the benefits. However it is not an argument for leaving the monetary union, he adds. Firstly, Finland could have acted to make the union more beneficial, and still can, by becoming more integrated part of the common currency. Secondly, a lot of economic issues in Finland are caused by something else than the membership of the EMU. Thirdly, the membership had also political reasoning behind it, which might have become more relevant than it initially was. The exit process has its own costs as well. (Vihriälä, 2017.)

Vihriälä agrees with academics, that the EMU membership provides challenges in reacting towards large asymmetric shocks. The lack of exchange rate flexibility, in other words, own national monetary policy is a serious issue, but freezing wage level is a good substitute for it, he says. A decrease in nominal wages is not realistic anywhere, but even freezing provides positive effects. According to estimates, freezing the wage level could have offered almost the same benefit as flexible exchange rates. (Vihriälä, 2017.)

The EMU-membership brings a stable and safe currency, lowers inflation and interest rates, and makes price comparison easier. More unclear is to determine the degree of these benefits. During the euro, Sweden's foreign trade has increased more than

Finland's, implying that the benefit of the common currency has not been great. Inflation has indeed declined, but Vihriälä says it is not due to the EMU-membership. The process with inflation and stable interest rates have been similar in Sweden that is not a member state. Even if the EMU might have complicated the recovery from the Euro crisis as the Finnish labor market is not sufficiently flexible, the EMU cannot be blamed for everything. Along with the inability to adapt to decreased foreign demand, Finnish productivity had declined especially in the ICT sector. (Vihriälä, 2017.)

Finland's decision to join the EMU was primarily a matter of foreign and security politics. The Finnish EMU-report or its appendices did not raise a lot of discussion among professionals or the public, the committee chairman Pekkarinen writes. Also, the report was not crucial for the political decision of joining the EMU, but later it has been used as an example for advocating the membership, he adds. Just like in the EMU-report, Pekkarinen emphasizes the problem of asymmetric shocks, and how Finland was critically hit by them in the cases of Nokia cluster, lumber sector, machinery sector and in trade with Russia. (Pekkarinen, 2018.) Economists seem to agree on the domestic reasons for the early 2010s recession. Especially Nokia is often mentioned.

On income policy, Pekkarinen writes that during the worst years of the Euro crisis, income flexibility was not sufficient. The role of wage flexibility was emphasized as a stabilizing tool against negative shocks. Generally, this means coordinated reductions in nominal wage levels. He says that in 1997 labor market organizations agreed to consider the EMU preconditions in their wage bargaining structure, but it was just all talk without any action. At the peak of the boom in 2007, before the global financial crisis, the labor market organizations settled on high agreement-wage raises, which reduced Finland's competitiveness during the crisis. The wage agreement system could not sufficiently adapt to the problems of export sectors, and thus increase competitiveness against other countries. (Pekkarinen, 2018.)

The ECB's monetary policy was to keep the interest rate low to revitalize economies of the Eurozone. Probably Finland would have done exactly the same if it had the own currency, but the difference would have been in exchange rates. A healthy economy and budget surplus of Germany kept the euro rather strong compared to other

currencies. The markka instead, would likely have depreciated, due to its globally minor weight and weak condition of the Finnish economy back then. Both Pekkarinen (2018) and Vihriälä (2017) support the mentioned depreciation consequence of the markka. Pekkarinen reckons that this low-interest rate – cheap currency combination would have been better for the country's competitiveness. Hence, own currency would have been more beneficial than the euro. On the other hand, there is a possibility that when depreciation is too strong, the investors might interpret it as a currency risk, which leads to an increased interest rate and consequently to a budget deficit. The question of the euro or not is multifaceted and hard to answer. During the first years of the 2010s, in an ideal situation, the own currency would have been a win-win choice, but no one can tell how the markka would have floated in real life, Pekkarinen concludes. (Pekkarinen, 2018.)

6 EMPIRICAL ANALYSIS

This chapter attempts to account for the optimum currency areas theory with empirical methods. The objective is to examine whether empirical data supports the theoretical framework in the case of the Eurozone. Especially Finland's economic relation to the other member states of the monetary union is a subject of interest, as the results may approve or disapprove Finland's membership in the monetary union. The data is historical, but the results are presumed to reflect the present in a way that the decision would be based on it.

The subject of examination is to find symmetries and asymmetries of economic growth patterns between the certain EMU-member states and then investigate how the countries' unemployment rate is affected by them. Potential symmetries support the economic reasoning of the monetary union and *vice versa*. The analysis does not attempt to answer which or what kind of countries should form a monetary union, nor does it try to fulfill any particular criteria of the OCA-theory literature, for example, McKinnon's openness view or Kenen's economic diversity view. This is mostly due to lack of time and such a large empirical analysis would probably exceed the purpose of a master's thesis.

According to Martin et al. (2016), the analytic approach to regional economic fluctuations began in the 1940s of the studies of Vining (1945, 1946a, 1946b) and Neff (1949). Neff's main question in his analysis was the following, "Do industrial areas experience fluctuations in business which differ from those elsewhere in any significant respect?" (Neff, 1949, pp. 109). Fundamentally this is the objective of the empirical analysis carried out here, but in an international level and with a comparison of aggregate outputs. In the regional economics literature, the focus has shifted to somewhat more sophisticated topics such as regional innovation systems and agglomeration processes, but for long the Keynesian theory was a basis for the business cycle research. Thus, out of trend economic fluctuations (shocks) are primarily caused by short-run changes in aggregate demand. The empirical analysis of this thesis follows the Keynesian view. Furthermore, the GDP trend shocks are shifts in exports that can be stimulated with national monetary policy which is not the case in the EMU. As mentioned in chapter four, the OCA-theory has provoked a lot of

empirical research, in which business cycle analysis has often played a major role. Namely, see Partridge and Rickman (2005), and Barrios et al. (2003) on regional business cycle asymmetries.

The data used in this analysis is gathered from well-known and reliable sources. The euro period real GDP time series is from the Federal Reserve Economic Data (FRED) database maintained by the Federal Reserve Bank of St. Louis. The pre-euro real GDP data is from the World Bank database. The unemployment and employment statistics are from the Eurostat database. The German specific data is from the Federal Statistical Office of Germany (Destatis). Lastly, the Finnish specific data is from the official statistics of Finland (Tilastokeskus). All the results are statistically significant at the 5% level unless otherwise specified.

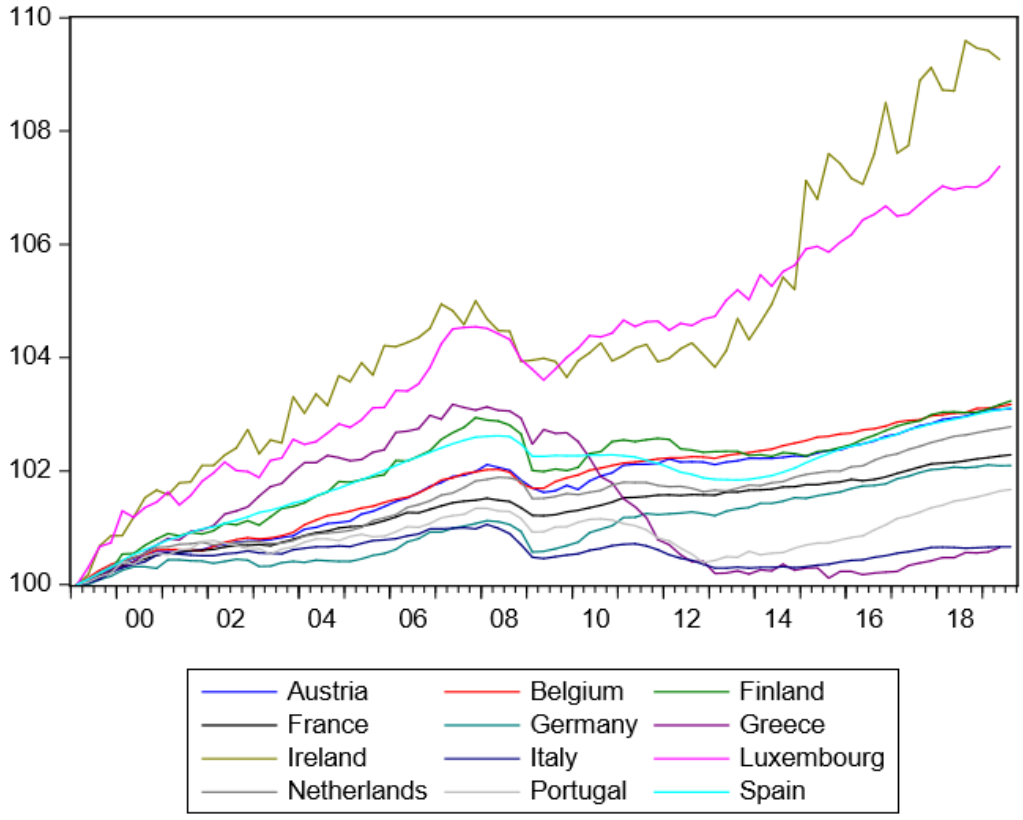

Figure 2. Normalized logarithmic real GDP in certain Euro countries between 1999Q1–2019Q3, 1999Q1=100 (FRED, 2020).

The line graph in figure 2 visualizes normalized (1999Q1 = 100) seasonally adjusted logarithmic real GDP between 1999Q1–2019Q3[16] in 12 European countries. All of them are original Eurozone member states and have adopted the euro in 1999, except for Greece that joined two years later in 2001. Greece is regarded here because it is still one of the early euro-users and it has experienced a remarkable economic crisis during the common currency and thereby it is interesting to study. The following micronations; Monaco, San Marino, and the Vatican are not considered here, because their significance is negligible due to their size.

As shown in figure 2, the GDP in Ireland and small Luxembourg has increased substantially in comparison with other countries. Also, the decline of Greece is prominent in the graph. None of the countries could avoid the global financial crisis, yet no country fell below the index of 100 during the observation period. Even if there is a distinct cluster of a few countries, dispersion in economic growth among the member states is significant. For instance, in the period of approximately twenty years, the economy of Italy grew by 9%, as Ireland grew by 158% and Finland by 41%. Based on the positive growth values, it is impossible to say, what is the role of the common currency regarding economic growth. In theory, it should enhance the growth, as stated in chapter one.

[16]2019 quarter 3 data is not available from Greece, Ireland or Luxembourg.

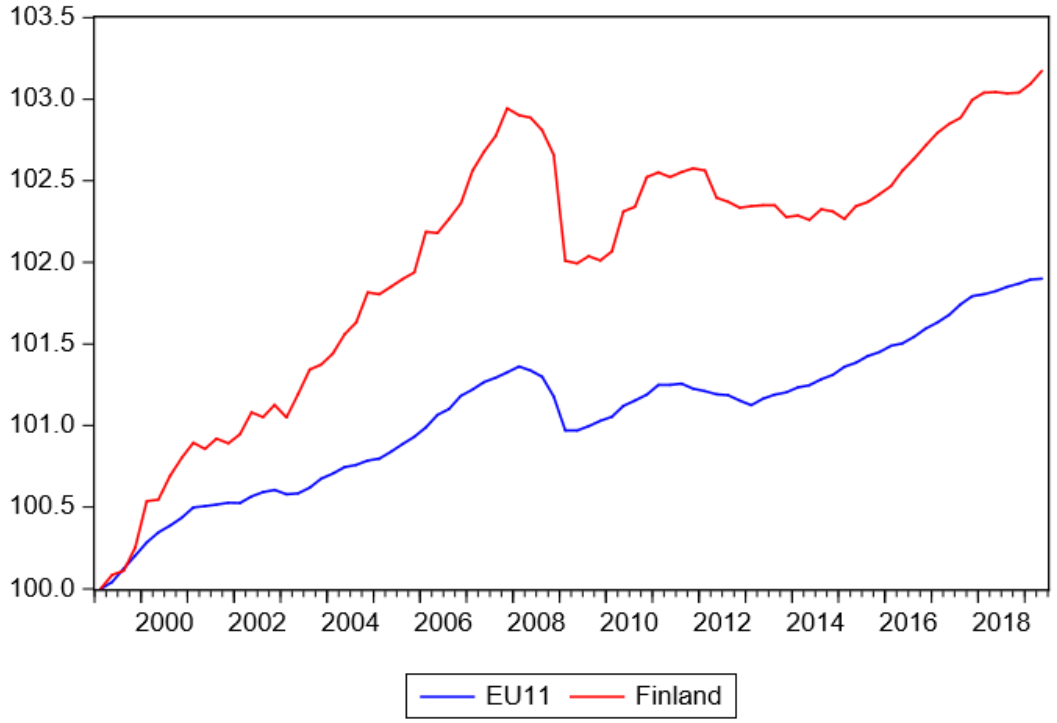

Figure 3. Normalized logarithmic real GDP in Finland and EU11 between 1999Q1–2019Q2 (FRED, 2020).

In figure 3, Finland's GDP growth is compared to the unweighted total value of the other eleven members' of the Eurozone (called EU11 here). As it is evident from the graph, the progression is identical, while Finland is having different growth rates, generally higher than the group of the other Eurozone countries. Another observation is that Finland does not seem to have pronounced asymmetric shocks with respect to the EU11. The correlation coefficient of 0.96 supports this intuition.

Probably, the strong ICT sector led by Nokia is one reason for Finland's high performance in the early 2000s like the Finnish economists have thought. On the other hand, Finland suffered a bit more from the global financial crisis than the EU11 group. If Finland were to have a higher growth rate than the other member states, it could be unfavorable for the country in theory. The ECB would not touch the interest rate for the sake of Finland, and this intensifies the boom that likely leads to inflation. In recessions instead, the general interest rate may remain too high for revitalizing Finland's economy, and in turn, recovery takes longer than it would with its own monetary policy (see Finland's steeper fall around 2008 in figure 3). However, for example, Ireland has had low inflation during its high economic growth after 2014,

but the details are unknown to conclude it here. In fact, not a single country had an inflation rate of over 5% during the observation period (FRED, 2020).

6.1 Shock analysis

The concept of asymmetric shocks can be viewed as the core of the OCA-theory because according to it, countries in a monetary union are rather powerless against asymmetric shocks, in case wage flexibility and labor mobility are insufficient. As mentioned in this thesis, wage flexibility is often low at least downwards, and international labor mobility is not much better either. The Finnish EMU-Committee also acknowledged asymmetric shocks to be a challenge for Finland and the entire monetary union. Therefore, asymmetries between the countries are worth looking into.

6.1.1 1999–2019

Table 1. Statistical measures of normalized logarithmic real GDP trend deviations between 1999Q1–2019Q2.

	AT	BE	FIN	FR	DE	GR	IE	IT	LU	NL	PT	ES
σ	0.19	0.15	0.41	0.13	0.15	0.99	0.95	0.22	0.35	0.19	0.30	0.41
Max	0.56	0.40	1.08	0.32	0.24	1.78	1.73	0.50	1.04	0.50	0.52	0.82
Min	-0.35	-0.37	-0.83	-0.38	-0.42	-1.87	-2.04	-0.55	-0.91	-0.39	-0.61	-0.86
β	0.033	0.035	0.029	0.023	0.024	-0.01	0.090	0.000	0.078	0.027	0.009	0.026
R^2	0.95	0.97	0.75	0.95	0.94	0.11	0.84	0.00	0.96	0.92	0.32	0.71

AT = Austria, BE = Belgium, FIN = Finland, FR = France, DE = Germany, GR = Greece, IE = Ireland, IT = Italy, LU = Luxembourg, NL = Netherlands, PT = Portugal, ES = Spain,
σ = standard deviation of residuals, Max = maximum residual value, Min = minimum residual value, β = slope of the trend line, R^2 = coefficient of determination

Table 1 shows the standard deviations of residuals between logarithmic real GDP data points and the trend line. Due to the residual mean equals zero, the values are comparable. Higher the standard deviation the more extensively GDP fluctuates around its trend within the time period. Accordingly, the standard deviation measures

the volume of economic shocks against the trend. However, it does not tell how intensive the shocks have been. Minimum and maximum values, and the illustrative residual graphs in appendix 1 as well, give comprehension about the shape of the shocks. β coefficients are slopes of the trend lines, depicting average quarterly growth rates. Values of R^2 describe how well the trend lines explain the behavior of the countries' realized GDP.

The trend line is formulated followingly:

$$lnY_t = \alpha + \beta t + \varepsilon_t, \quad (1)$$

where lnY is normalized logarithmic real GDP, α parameter is the intercept, β parameter indicates the slope of the trend line and ε is an error term at time t.

With the given information, one can tell that the observed countries differ greatly from one another. Greece and Ireland have experienced stronger shocks out of trend than say Germany, France, or Belgium. The graphs of appendix 1 certainly confirm this. Also, the peak values of the former countries are multiple times larger than the latter. On the other hand, the R^2 value of Greece is only 0.11, which means that the trend line is a poor model for describing the country's GDP evolution over the years. Italy (R^2=0.00) is an extreme case, as the trend line cannot tell anything about its GDP growth, and that is recommended to bear in mind when looking at the other numbers of Italy. Additionally, β parameters of Greece and Italy are somewhat dubious. Greece faced a long economic crisis after years of relatively high growth and Italy had a low but unsteady growth instead, which might reason why the trend models are not appropriate for these countries. The varying β parameters imply the same as figure 2. Member states of the EMU have large differences in GDP growth rates, which can stress the economic cohesion of the monetary union. In the long run, the growth rate differences widen the gap in living standards.

Ireland's massive, sawtooth-like economic growth has large-scale deviations, but the trend line itself seems suitable, as the R^2 value suggests. Overall, the appendix 1 residual graphs look reasonable. Each of them captures the rise and fall of the 2008

global financial crisis at least to some extent. Besides Italy and perhaps Portugal, the trend lines are fairly descriptive in terms of the actual course of GDP, hence the examination of the deviations is sensible.

Finland's standard deviation is relatively high compared to the core countries of the Eurozone such as Germany, France, Belgium, Austria or the Netherlands. This might imply some kind of asymmetries between Finland and the others. Furthermore, the amplitude of Finland's shocks is even double the size to the above-mentioned countries. Spain, on the other hand, has exactly the same standard deviation as Finland and in addition, their residual graphs are very similar. A deeper country-specific examination could bring insight to some similar or at least concurrent economic phenomena between Finland and Spain. Overall, the table values emphasize the image of Finland being geographically and economically in the periphery of the euro area, but one should not draw conclusions whether Finland would be better off without the monetary union.

Table 2 is a correlation matrix of the GDP trend deviations. All the countries are compared between each other and lastly, the average value and the aggregate correlation (EU11 column) without the concerned country are calculated. The latter has the highest weight because the common monetary policy is determined by following a majority rule, thus deviations denote a weaker position in the euro. The average values are not mathematically weighted but still offer a quick look into commonalities. Here the correlation is a measure of simultaneous out of trend shocks between the countries. Negative values indicate asymmetry.

The first conspicuous observation is Germany, that does not have a correlation over 0.5 with any of the listed states, and clearly has the lowest relation to the aggregate GDP (EU11). Why doesn't the economic powerhouse of the Eurozone share the same shocks with the lesser members, which are assumed to be dependent on Germany regarding trade? For long, Germany has had one of the highest trade surpluses in the world, which may explain the weak correlation of the shocks in case the received money is not invested in the Eurozone (Destatis, 2020). Assuming that Germany has a lot of surplus trade with the United States, as in fact it does, in case the received dollars from trade are not invested further in other EMU-countries, but left on German

bank accounts, the trade boom remains only in Germany and symmetric shocks will not occur. On the other hand, the Netherlands has a large trade surplus as well, but its shocks are well correlated with others.

Ireland is along the same lines with Germany, as it is somewhat weakly correlated with others. A simple explanation could be that the country's tremendous economic growth is in a different league and it does not seem to follow the aggregate trend nor is it effectively hit by global shocks. Despite the economic crisis in Greece, its shocks are still surprisingly well synchronized with the other member states, except for Germany that has the only negative correlation in the table. Again, the graphs in appendix 1 can confirm this. The Greek shocks occur about the same time and are corresponding with the other states, but certainly, the amplitudes are huge in comparison.

By and large, the values of table 2 support the economic aspect of the Eurozone concerning the EU11. The lack of negative correlations indicates that there aren't considerable asymmetric shocks that would provide serious economic harm to the countries. In other words, according to the positive values of the table, the ECB's monetary policy affects the countries in the same manner, some more and some less, but it is a benefit for all (Germany-Greece relationship is an exception). Hence, none of the countries should meet the consequences of asymmetric shocks, such as unemployment or inflation from appropriate supranational monetary policy of the ECB. Some simple assumptions can be drawn here. Potentially the general economic trends might have such a strong influence resulting in asymmetries disappearing in the shown numbers. Also, it is noteworthy that not all the Eurozone members are analyzed here, even though the EU11 consists of the largest economies of the area in question. However, the aggregate correlation values are quite high and positive, which supports the absence of asymmetric shocks between the countries. It is worth emphasizing that both symmetric and asymmetric shocks here are GDP deviations from the trend lines. The countries might still have sectoral asymmetric shocks within their economies. For instance, a decline in the car industry in country A, while country B car industry is booming.

Finland's correlation to the EU11 group of the other countries is high (0.87) meaning that theoretically, the common monetary policy of the ECB is positive for Finland on every occasion. Therefore, the cost of the common currency in this matter is low, which supports the membership. Concerning individual countries, the economic shocks of Finland and Germany are weakly correlated (0.13), despite the fact that Germany is the largest trading partner of Finland (Tilastokeskus, 2019). One could expect the trade relations to link the shocks together in these countries. Bayoumi and Eichengreen (2017) have concluded that Finland is one of the least correlated member states with the benchmark country Germany in their supply and demand shock analysis. Additionally, they find Belgium quite weakly correlated as well, but on the other hand, they count Spain to be one of the core countries of the Eurozone, while in this thesis Spain has the smallest correlation coefficient with Germany in the euro period.

Table 2. Correlation matrix of trend deviations of logarithmic real GDP between 1999Q1–2019Q2.

	Austria	Belgium	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	Netherlands	Portugal	Spain	Average	EU11
Austria	1.00												0.75	0.89
Belgium	0.93	1.00											0.73	0.86
Finland	0.94	0.94	1.00										0.75	0.87
France	0.92	0.92	0.93	1.00									0.77	0.91
Germany	0.34	0.22	0.13	0.32	1.00								0.24	0.22
Greece	0.74	0.79	0.87	0.76	-0.23	1.00							0.64	0.69
Ireland	0.28	0.29	0.26	0.43	0.46	0.27	1.00						0.43	0.56
Italy	0.88	0.88	0.92	0.94	0.27	0.82	0.53	1.00					0.79	0.95
Luxembourg	0.74	0.79	0.73	0.82	0.49	0.60	0.65	0.81	1.00				0.71	0.88
Netherlands	0.88	0.80	0.83	0.82	0.41	0.72	0.48	0.87	0.76	1.00			0.76	0.92
Portugal	0.71	0.66	0.72	0.73	0.26	0.74	0.63	0.87	0.71	0.90	1.00		0.71	0.87
Spain	0.83	0.84	0.91	0.85	0.01	0.95	0.46	0.93	0.73	0.85	0.86	1.00	0.75	0.82

Table 3. Correlation matrix of trend deviations of logarithmic real GDP between 1970–1998.

	Austria	Belgium	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	Netherlands	Portugal	Spain	Average	EU11
Austria	1.00												0.57	0.86
Belgium	0.88	1.00											0.61	0.93
Finland	0.14	0.37	1.00										0.15	0.35
France	0.79	0.87	0.57	1.00									0.53	0.89
Germany	0.68	0.63	-0.20	0.54	1.00								0.43	0.58
Greece	0.77	0.73	0.39	0.77	0.37	1.00							0.45	0.71
Ireland	0.35	0.28	-0.18	0.00	0.09	0.36	1.00						0.18	0.09
Italy	0.55	0.68	0.67	0.89	0.37	0.65	-0.25	1.00					0.36	0.64
Luxembourg	-0.02	0.03	-0.46	-0.27	0.43	-0.45	0.13	-0.46	1.00				0.00	-0.01
Netherlands	0.60	0.58	-0.22	0.23	0.53	0.35	0.72	-0.07	0.55	1.00			0.41	0.41
Portugal	0.76	0.85	0.32	0.79	0.72	0.57	0.21	0.59	0.20	0.49	1.00		0.57	0.87
Spain	0.74	0.84	0.20	0.65	0.58	0.45	0.26	0.38	0.39	0.73	0.75	1.00	0.54	0.71

6.1.2 1970–1998

Another point of interest is the difference between the period with the common currency compared with the time without the euro in terms of GDP shocks. Has the common currency integrated economies of the Eurozone? Next, the above-used methods are applied to non-seasonally-adjusted annual real GDP between 1970–1998 (Worldbank, 2020). Quarterly data is not available.

Table 4 shows the standard deviations of the normalized logarithmic real GDP residuals between 1970–1998. The mean of standard deviations is 0.35, whereas it is 0.37 for the period of 1999Q1–2019Q2. Comparing mean values of standard deviations is not necessarily appropriate regarding foundations of statistics, nevertheless, the values are exceedingly alike, giving the impression that stabilization has not been huge.

Table 4. Statistical measures of normalized logarithmic real GDP trend deviations between 1970–1998.

	AT	BE	FIN	FR	DE	GR	IE	IT	LU	NL	PT	ES
σ	0.21	0.21	0.47	0.21	0.16	0.50	0.50	0.26	0.83	0.23	0.37	0.30
Max	0.37	0.37	0.92	0.31	0.34	0.98	1.36	0.42	1.31	0.43	0.58	0.49
Min	-0.59	-0.55	-0.83	-0.56	-0.23	-1.41	-0.78	-0.48	-1.51	-0.37	-0.76	-0.65
β	0.209	0.182	0.228	0.176	0.165	0.157	0.390	0.187	0.407	0.187	0.289	0.199
R^2	0.99	0.98	0.94	0.98	0.99	0.88	0.98	0.97	0.95	0.98	0.98	0.97

AT = Austria, BE = Belgium, FIN = Finland, FR = France, DE = Germany, GR = Greece, IE = Ireland, IT = Italy, LU = Luxembourg, NL = Netherlands, PT = Portugal, ES = Spain,
σ = standard deviation of residuals, Max = maximum residual value, Min = minimum residual value, β = slope of the trend line, R^2 = coefficient of determination

Extreme rates close to 1.0 do not occur in the first period as opposed to the euro era. The minimum and maximum values are a bit lower on average during 1970–1998 compared to the latter period. Greece and Ireland are certainly more volatile within the Eurozone than without, unlike tiny Luxembourg, that has attained stability for its part.

Higher β coefficients in table 4 indicate a higher average annual growth rate during the corresponding time frame. Also, none of the coefficients seems to be offline from the sample.

It is interesting how well the trend lines respond to actual GDP evolution, based on the R^2 values. This implies, that there are not any peculiar or unusually intensive economic shocks in years between 1970–1998. The 1973 oil crisis is not particularly prominent in appendix 2 residual graphs, unlike the bump of the 2008 financial crisis in appendix 1. If the 1970–1998 GDP evolution seems to fluctuate tightly around its trend, thus is involatile, then why the shock standard deviations are about the same magnitude in both time frames? This could be perhaps due to the total GDP growth being higher between 1970–1998 than during the euro period, so the shocks are relatively smaller before the common currency, as the standard deviations are in absolute values.

The overall assumption is that the observation period before the euro was economically slightly more stable than the period without it. Having said that, it definitely requires a deeper look into the topic to make up a proper conclusion, but if one has to answer yes or no, whether the euro has increased economic stability, then the answer is no. Without the unforeseen 2008 global financial crisis and the subsequent Euro crisis, the outcome would have most likely been the opposite. It is worth noting that the analysis is naive and only addresses shocks in general, not asymmetric ones. Regarding Finland, its residuals' standard deviation is slightly less after adopting the euro, but no significant changes can be noticed. As an interesting side note, from appendix 2 graph of Finland, the deep infamous 1990s depression, and the preceding so-called casino years can be clearly noted there.

Speaking of asymmetric shocks, table 3 presents residual correlations between the already familiar 12 Eurozone countries in the years 1970–1998. Now Germany is not a distinct outlier, unlike Luxembourg or Ireland. Finland's situation is not flattering either as the correlation coefficient to the EU11 group is only 0.35, which is among the lowest. In addition, Finland has negative ratios with some countries, indicating asymmetric shocks, which would theoretically hinder the effectivity of supranational monetary policy.

Instead of browsing dozens of individual correlation coefficients, figure 4 illustrates single countries' correlation to the EU11-group in the two periods. In terms of integration, France, Portugal, Austria, Greece and perhaps Belgium seem to be less or more indifferent whether they have common currency or not. The first three nations also strongly adhere to the aggregate EU11 GDP progress, making them appropriate member states under the concept of asymmetric shocks. On the other hand, these mentioned countries' mutual economic movements might vary a lot as they do. For example, Portugal - Belgium correlation coefficient is only 0.66, which is lower than the EU11 correlation of 0.87 between 1999Q1–2019Q2.

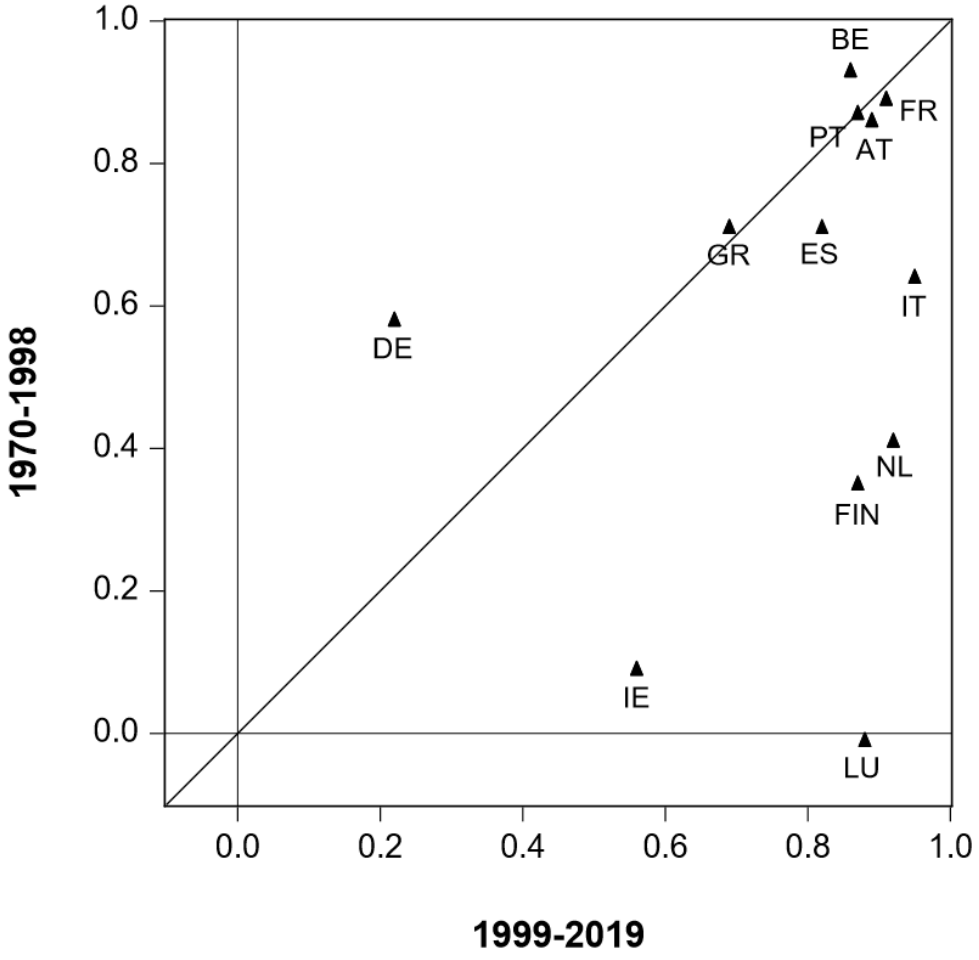

Figure 4. Correlation with EU11 countries in the two periods.

The figure suggests that Luxembourg, Finland, Netherlands, Italy, and also Spain are the winners of the original Eurozone (including Greece). Indeed, those countries' out of trend shocks are more synchronized in the euro than they were with their own

national currencies, but it does not mean that all the countries are yet close to the ideal position of 1.0 correlation coefficient, like Ireland. However, the change is fairly positive as the negative correlations between the members are gone after the adaptation of the common currency.

Instead of integrating, Germany has separated from the other group, meaning it is now facing asymmetric shocks more intensively than it did during the deutschemark. According to the Federal Statistical Office of Germany (Destatis, 2020), the German trade surplus has had an upward trend since the 1950s, which has intensified during the 2000s. This goes hand in hand with economic differentiation in terms of the GDP shocks. Whether there is any real relation remains unexplored in this analysis.

As shown in figure 4, there are more winners than losers, indicating that the countries are shock-wise more integrated with the euro than they were without, and according to the theory, this is a positive outcome. Also, the mean correlation to the EU11 in the first period is 0.59 whereas it is 0.79 in the latter, which supports the proposition of the integration. How significant is the role of the common currency is again another question that requires deeper examination. Both Bayoumi and Eichengreen (2017) show mixed results about the economic integration. According to them, supply-based shocks are more coherent in the euro period than they were before it, but on part of demand-based shocks, the evidence does not support cohesion.

6.2 Unemployment and shocks

Unemployment is generally considered a negative economic and social phenomenon. High unemployment increases transfer payments, which strains the public economy and thus economic growth of a country as resources are not efficiently in use. In a monetary union, the only way to deal with temporary domestic unemployment issues is to practice expansive fiscal policy and hope that the unionwide monetary policy is favorable. Eventually, the expansive fiscal policy might lead to a budget deficit and indebtedness, whereat national monetary instruments such as devaluation or interest rate adjustment would have worked out better. Alternatively, even passive utilization of national currency could boost competitiveness and thus employment at least in small

countries. Minor currencies tend to be less valued than major ones (See Vihriälä, 2017 and Pekkarinen, 2018 on Finland and Euro crisis).

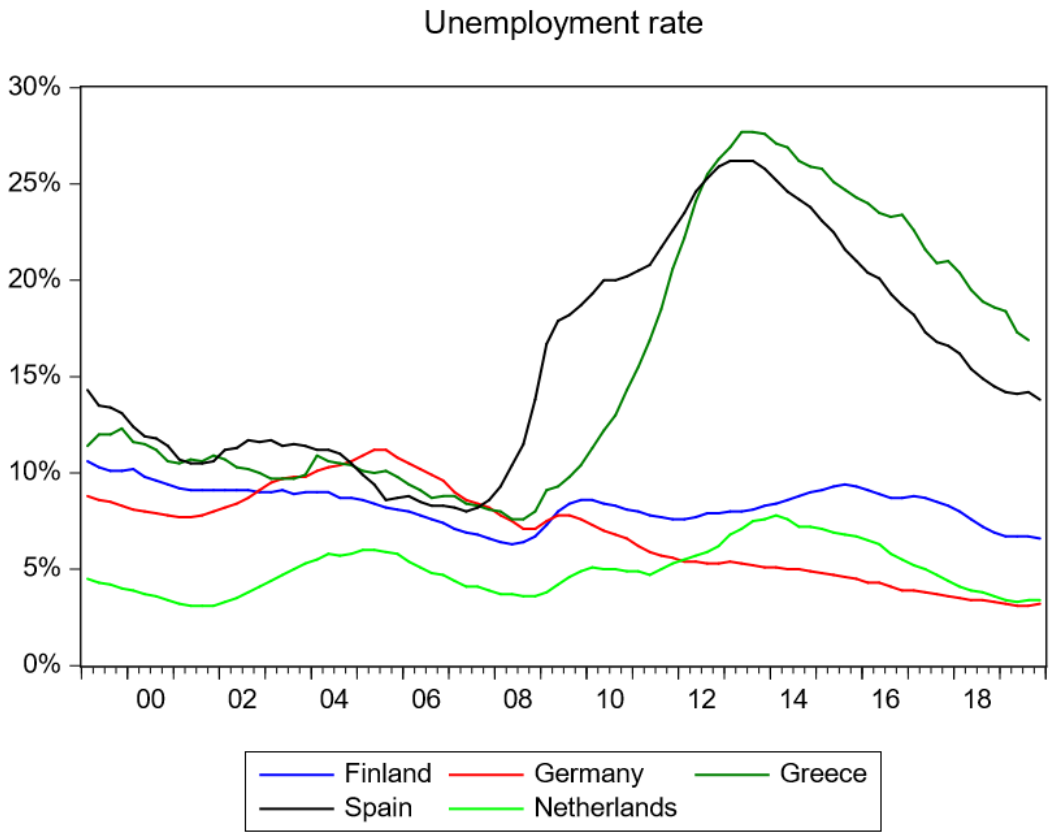

Figure 5. Seasonally adjusted unemployment rate in certain EMU-countries between 1999Q1–2019Q4 (Eurostat, 2020).

Figure 5 illustrates the seasonally adjusted quarterly unemployment rate in a few EMU-countries between 1991Q1–2019Q4. The differences are quite large. Southern member states Spain and Greece seem to have naturally higher unemployment rate than its northern counterparts Finland or the Netherlands. Germany has sailed somewhere between those, but currently has a very low 3.2% unemployment rate. The years after the Euro crisis have been remarkably adverse for Greece and Spain. In both countries over one-fourth of the labor force was unemployed at some point. For less than 25-year-old citizens the unemployment rate was over 50% during the worst years of 2012–2014 (Eurostat, 2020). How the ECB should practice its monetary policy to satisfy member states like Germany and Greece simultaneously, as according to the theory a low-interest rate would increase inflation in Germany while it would revitalize Greece? Again, this question is linked to the concern whether the Eurozone is too

heterogeneous while emphasizing clearly too insufficient labor mobility within the union for balancing out the unemployment issues.

How country-specific unemployment levels react to the out of trend GDP shocks is calculated in this phase. It is quite safe and reasonable to assume, that economic booms and recessions have an influence on unemployment and not *vice versa*. Therefore, the causal connection is unquestionably given as it is assumed that shocks likely affect unemployment. According to Eurostat (2020), the unemployment rate is the number of unemployed persons as a percentage of the labor force. The employment rate is calculated by dividing the number of persons aged 20 to 64 in employment by the total population of the same group.

Table 5. Unemployment and employment correlations between 1999Q1–2019Q3/Q4.

	AT	BE	FIN	FR	DE	GR	IE	IT	LU	NL	PT	ES
Correlation between seasonally adjusted unemployment rate and trend deviations												
t	-0.23	-0.11	-0.80	-0.74	-0.22	-0.54	-0.80	-0.80	0.01	-0.62	-0.47	-0.54
t+1	-0.28	-0.12	-0.82	-0.74	-0.22	-0.53	-0.79	-0.80	0.01	-0.64	-0.44	-0.48
t+2	-0.28	-0.09	-0.80	-0.70	-0.21	-0.50	-0.77	-0.79	0.03	-0.64	-0.39	-0.42
Correlation between seasonally adjusted employment rate and trend deviations*												
t	0.03	0.31	0.55	**	0.04	0.70	0.89	0.72	-0.02	0.25	0.68	0.90
t+1	0.08	0.31	0.55	**	0.04	0.68	0.89	0.73	0.01	0.31	0.64	0.84
t+2	0.10	0.30	0.55	**	0.01	0.65	0.87	0.74	-0.06	0.32	0.57	0.78

AT = Austria, BE = Belgium, FIN = Finland, FR = France, DE = Germany, GR = Greece, IE = Ireland, IT = Italy, LU = Luxembourg, NL = Netherlands, PT = Portugal, ES = Spain,
t+1 and *t+2* = Number of lagged quarters,
*Employment rate data not available from 2019Q4,
**Data is not available

Table 5 shows the unemployment and employment rate correlations with respect to the GDP shocks between 1999Q1–2019. *t* indicates a non-lagged correlation. *t+1* and *t+2* are one or two lagged quarters correlations. The lagged quarters are taken into account because according to the hysteresis hypothesis, unemployment changes might occur with a delay[17]. The first observation is that principally the unemployment rate is inversely proportional to positive GDP shocks, as it should be. This gives support to the validity of the shock analysis model used in this thesis. Correspondingly, the employment rate correlations are expectedly positive. According to neoclassical economics, labor demand is derived from an employer's demand to increase production output, which depends on market demand for end-products. Hence, it is assumed here that GDP trend deviations are the ultimate factor affecting the unemployment rates, so the correlations present labor markets' sensitivity to react to output shocks.

The correlation values differ quite a lot. Based on the numbers, the Finnish, Irish and Italian labor markets react to shocks rather sensitively in the form of unemployment rate (0.80 coefficient). The unemployment rate of Luxembourg instead does not change almost at all, and the other countries are somewhere in between. High unemployment rate correlations might indicate that wage levels are rigid downwards, wage and other labor expenses take a large proportion of all costs, or collective layoffs are legally easier to execute than individual ones. Lagged values *t+1* and *t+2* are very similar to the unlagged values, which means that the shocks affect unemployment with little or no delay.

Employment rate correlations vary as much as the unemployment correlations. The author's own presumption was that the employment rates do not react to shocks as sensitively as the unemployment rates, as the former rate includes students and retired citizens who are not active in the labor market. The average unemployment rate correlation is -0.49 and the employment rate is 0.46, that are about the same size. In

[17] See Blanchard & Summers (1986).

addition, the correlation coefficients do not seem to have any significant relations or differences between themselves, for instance southern *versus* northern member states.

The correlations represented the sensitivity of the labor market to the shocks. Now the interest is in the amplitude of how intensively the shocks affect the countries' unemployment rates. A simple linear regression captures the relation between the shocks and changes in unemployment. The model is formulated followingly,

$$U_i = \alpha + \beta r_i + \varepsilon_i, \quad (2)$$

where U is the unemployment rate in percentage, α parameter is the intercept, β parameter is coefficient, r is GDP trend deviation and ε is error term in an observation i.

Table 6. Results of the regression analysis.

	AT	BE*	FIN	FR	DE	GR	IE	IT	LU*	NL	PT	ES
α (%)	4.95	-	8.35	9.16	6.95	15.45	8.17	9.42	-	4.96	9.61	15.72
β	-0.79	-	-1.87	-4.62	-3.48	-3.72	-3.44	-6.97	-	-4.08	-5.34	-7.51
R^2	0.05	-	0.61	0.54	0.05	0.30	0.63	0.64	-	0.39	0.23	0.29
S (%)	±0.15	-	±0.77	±0.60	±0.52	±3.67	±3.27	±1.53	-	±0.78	±1.60	±3.08

AT = Austria, BE = Belgium, FIN = Finland, FR = France, DE = Germany, GR = Greece, IE = Ireland, IT = Italy, LU = Luxembourg, NL = Netherlands, PT = Portugal, ES = Spain,
α = constant term indicating a base percentage unemployment rate, β = Beta coefficient, R^2 = coefficient of determination, S = Percentage change in the unemployment rate by a standard shock
*Regression variable(s) is not statistically significant at $p < 0.05$.

α parameter in table 6 denotes the base unemployment rate without any positive or negative shocks occurrence. One should not interpret it as a natural rate of unemployment, even though technically it is that during the period of time in question. The numbers seem to be somewhat reasonable in a way that the general unemployment rates in Spain and Greece are higher than in Finland or the Netherlands, as figure 5 illustrates. Indeed, the α parameter of the Netherlands is only 4.96% as it is 15.45%

for Greece. The rates of the northern countries are a bit lower than the southern ones, but a precise distinction cannot be concluded.

β parameter is the coefficient for the shocks and describes how vulnerable the unemployment rate is to them. The values between countries are comparable and thus the table reveals large differences. For example, the labor market in Spain reacts to GDP shocks almost ten times stronger than in Austria. Finland's ratio of 1.87, implies that the Finnish labor market is more rigid than general in the analyzed EMU peer countries. On the other hand, the relatively low R^2 values allude that the model is not accurate, but it does not genuinely matter, because some of the discoveries are yet supported by real-life observations. In addition, magnitude and comparison are more important concerns here than exact results.

Lastly, the *S* variable illustrates how much the unemployment rate would change, if a country was hit by a standard shock, that is a theoretical concept made up here. Standard shock is the size of a standard deviation of residuals and tries to imitate a statistically typical shock in a respective country. In order to get standard shocks, the standard deviations of table 1 are multiplied by the β parameters of table 6. The standard deviation's mathematical notation is always positive, but the assumption is that GDP shocks can be either positive or negative, so the values are reported in that way.

It can be seen that high β coefficients do not necessarily mean high standard shocks in case the standard deviations meaning that the degree of trend shocks have been low during the observation period between 1999–2019. For instance France and Finland are an example of that. The β coefficient of France is a lot larger than Finland's, but the French economy has been more stable, leading to smaller standard shocks.

7 SUMMARY

This thesis has three different purposes. Regarding theory, the objective is to introduce the optimum currency areas theory and the costs and benefits of a monetary union. This section serves as a theoretical framework for the chapters to come. The thesis is also a review of Finland's path to the EMU in the late 1990s. A comprehensive look into the official Finnish EMU-Committee report gives the reader insight into how the economists saw the pros and cons of the common currency. In addition, Finland and the EMU chapter includes the economists' present viewpoints on the EMU-membership. Lastly, a simple yet informative empirical analysis provides data about economic integration in the original Eurozone countries, and in Greece, concerning GDP trend deviations. How labor markets react to these shocks in the respective member states is also a subject of interest.

The costs and benefits of a monetary union are generally acknowledged and mostly unquestioned. Upon adopting a common currency, a country relinquishes its national monetary policy to the union central bank. As compensation, the common currency eliminates transaction costs and increases price comparability within the union. Also, uncertainty related to the exchange rates disappears as there is only one currency in use. Without national monetary policy, the member states cannot adjust their domestic quantity of money, thus it has an impact on the interest rates or re/devalue the currency. These actions are considered as powerful instruments against up- and downturns of an economy. Loosening interest rate stimulates investing and recovery from recession. Tightening, on the other hand, restrains inflationary spending, which is also negative even if the economy would be booming. In case the member states of a monetary union are experiencing contrary economic periods, the supranational monetary policy of the central bank is inevitably detrimental to some countries. Optimum currency areas theory is a study of this issue and attempts to define what kind of countries should form a monetary union, in order to achieve all satisfying central bank.

The purpose of the empirical analysis is to find out how well the original EMU-countries and Greece are correlated in terms of GDP trend deviations. The analysis follows the concept of asymmetric shocks of the OCA-theory. The assumption is that economic shocks, thus temporary booms and recessions shift GDP from its long-term

trend line. The subject of interest is how well these shocks, meaning GDP trend deviations, are synchronized between the member states. In practice, this comparison is done by calculating correlation coefficients among the single countries. Country-specific values might be interesting, but a country's relation to the aggregate GDP, called EU11 here, is the most important because it describes how well a single member state can theoretically benefit from the supranational monetary policy of the ECB. This stems from the assumption, that the common monetary policy follows a rule of the majority. Also, the analysis includes a comparison of the aggregate GDP correlations between two periods that of 1970–1998 and 1999–2019, which shows if the economic integration has changed after adopting the common currency. Finally, the last part of the empirical analysis examines how sensitively labor markets react to the GDP shocks in the member states.

7.1 Key findings

While theoretical and practical costs and benefits of a monetary union are generally known, the optimum currency areas theory cannot still explicitly answer what kind of regions or countries should form a common currency area regarding real-world circumstances. Minimizing asymmetric shocks requires some kind of economic integration, but the scientific community cannot say which is the decisive factor. Mundell's proposition of factor mobility works on paper, but seemingly not in real life. Wages are not flexible downwards, because no one is ready to give up the gained benefits or labor mobility is not sufficiently high due to social barriers. More or less the same applies to other theoretical propositions on economic integration. Some of them are even found incorrect, for example Corden's (1972) and Fleming's (1971) view on inflation. It is later pointed out that high-inflation countries can benefit from low-inflationary policy in a monetary union. In the very end, OCA-theory seems to be a theoretical academic discussion without strict rules but guidelines that could either work or not – in real life.

In 1997 the Finnish EMU-Committee concluded a rather comprehensive and satisfactory report about the potential EMU-membership, considering the very short time frame during which it was done. Economists could not, in any case, see the upcoming global financial crisis and the subsequent Euro crisis. The committee was a

bit suspicious about how strictly the no bail-out rule or the convergence criteria are followed, and they were right. The criteria did not have much weight and the crises forced the ECB to bail out some of its member states for instance Greece. A look back suggests that own currency could have worked out better in the recovery of the economic crises of the past decade. For example, Jukka Pekkarinen (2018), the chairman of the EMU-Committee is a bit prone to this standpoint but emphasizes that in the end, it is impossible to say how things would have gone in the real-world. On the other hand, the committee quite accurately foresaw what kind of monetary policy the ECB would practice.

Regarding the empirical analysis performed in this thesis, the results are surprisingly consistent and reasonable, meaning that interpretation can be highly reliable. According to the results, economic integration has increased among the original eleven EMU-countries and Greece during the euro period (1999–2019) compared to the pre-euro period (1970–1998). In this analysis, the economic integration is determined by how well the countries' GDP trend deviations thus shocks are correlated with each other. Germany is an interesting and prominent exception. It is weakly correlated with other countries in both periods and its economic integration has actually declined after adopting the euro. Finland is one of the 'winners' as it is now more integrated with others than it was in the markka period.

Conversely, the volume of the shocks, has not significantly declined upon the common currency. There are differences between the countries but one cannot state that the general economic stability would have increased. Without the occurred crises the situation could probably be completely the opposite. In regard to the shock correlation analysis, the most important observation is that not a single member state is negatively correlated to the aggregate GDP trend deviations. However, it might be that mutual fundamental economic movements cover potential asymmetries in the results.

The simple regression analysis implies that the country-specific labor markets react quite differently to the GDP trend shocks. An identical shock has a ten times stronger impact on the Spanish unemployment rate than the Austrian. Other member states are somewhere in between, though the results of Luxembourg and Belgium are not statistically significant.

Based on the numbers, the overall impression is somewhat mixed. The countries differ in economic growth, unemployment rates, and in labor markets. Additionally, amplitudes of the trend shocks vary quite a lot. In contrast, the economic integration process has been positive for most countries, even though the changes have not been similar in size.

7.2 Further research

In Europe, the interest rates have been generally low from the Euro crisis onwards. Currently, the ECB deposit rate is negative and has been like that already for a few years to revitalize economies. The key Main Refinancing Operations (MRO) rate is 0.00%. The phenomenon is economically intriguing and most likely the old-timer monetarists could have never seen that coming, as they believed in the effectiveness of monetary policy. At the same time, the negative interest rate is a bit worrying, because it suggests that the ECB cannot stimulate the economy of the Eurozone in a desired way. It looks like the low interest rates are not going away any soon. An exaggerated question could be whether the (European) monetary policy has lost its effectiveness? The issue is tightly related to the subject of this thesis because the fundamental assumption is that national monetary policy functions as expected in theory and is the cost of a monetary union. Therefore, the unprecedented low interest rates are worth taking look at.

The empirical methods used in this thesis are simple but still provide reasonable results. However, a more sophisticated approach could be carried out by separating GDP shocks into demand and supply disturbances by using the decomposition technique of Blanchard and Quah (1989). For example, Fidrmuc and Korhonen (2001), and Bayomi and Eichengreen (2017) have used the decomposition method in their research in finding similarities in supply and demand shocks in Europe. Results might offer a more comprehensive understanding of the shocks. Concerning the observed data, a comparison between Nordic countries would be interesting and perhaps bring forth more study into optimum currency areas debate: Finland the euro country *versus* the other Nordic countries.

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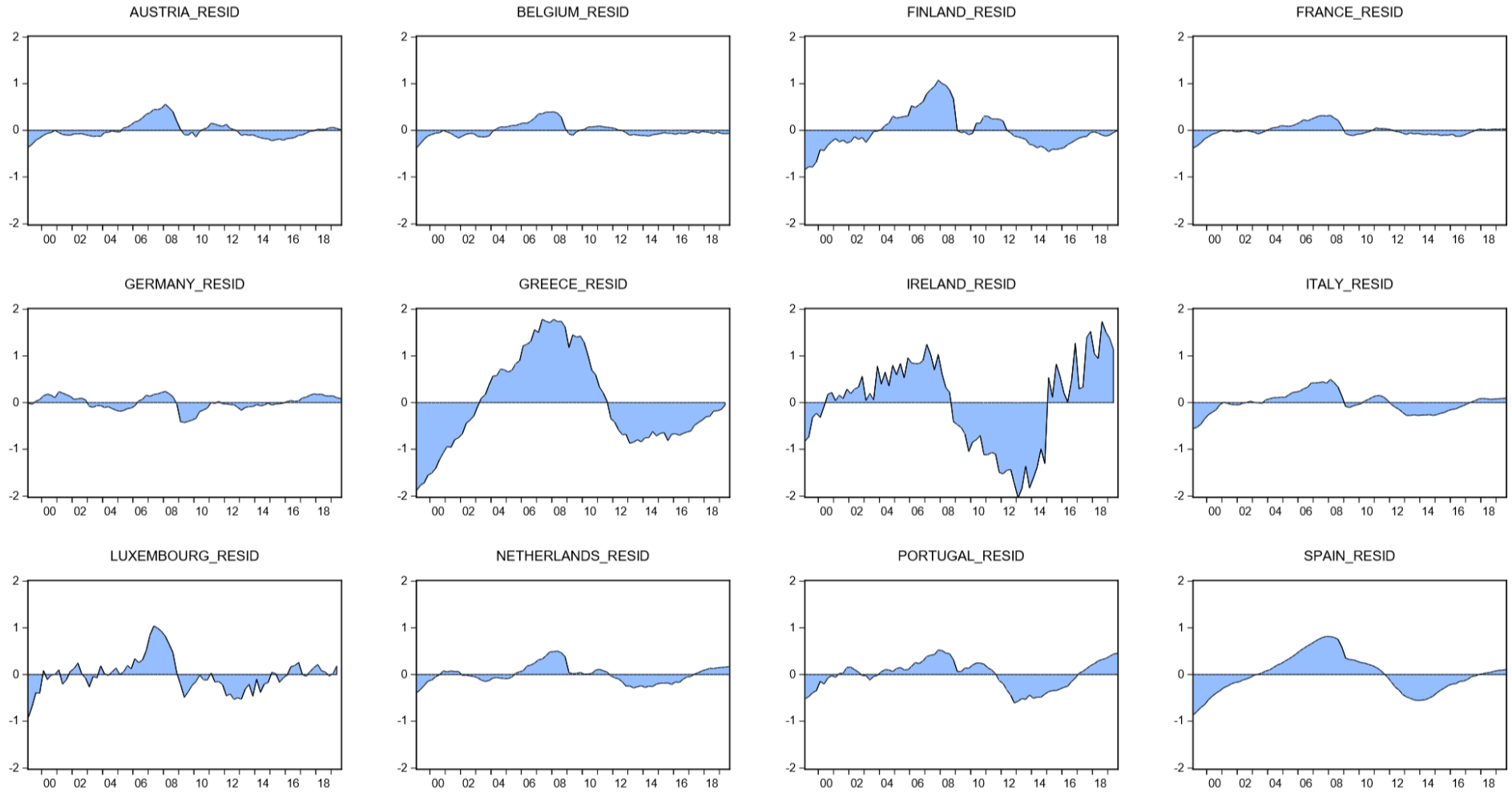
Appendix 1

GDP TREND DEVIATIONS 1999Q1–2019Q2.



Appendix 2

GDP TREND DEVIATIONS 1970–1998.